A Preliminary Annotated Bibliography of Literature on Small Mammals Relevant to Elk Island National Park

Prepared By
Gordon R. Burns
Canadian Wildlife Service
Edmonton
March 1984

CANADIAN WILDLIFE SERVICE

A PRELIMINARY ANNOTATED BIBLIOGRAPHY OF LITERATURE ON SMALL MAMMALS RELEVANT TO ELK ISLAND NATIONAL PARK

prepared by
Gordon Burns

Canadian Wildlife Service
Edmonton

March 1984

INTRODUCTION

The following bibliography of literature on small mammals was requested by Parks Canada in the terms of reference for the inventory of small mammals of Elk Island National Park and has been prepared in conjunction with the inventory.

The bibliography is preliminary. The literature search was limited to materials available in Elk Island National Park and Edmonton libraries. Limited time for the preparation of the bibliography also contributed to its preliminary nature.

Publications listed here deal with the small mammals or, more specifically, the non-ungulate mammals of Elk Island National Park and have been selected for their relevance to the park. Publications reporting on research in eastern Canada or northern United States were listed when more relevant material was not available. Similarly, literature describing a closely related species was cited when literature on a particular species was not available. Some publications were listed for species which were formerly resident in the park and for species which are either present and undetected or expected to occur based on published distribution maps.

Libraries where publications were found included the Cameron Library of the University of Alberta, the Canadian Forestry Service Library, the Thesis Collection of the Department of Zoology of the University of Alberta, the Warden Service Library of Elk Island National Park and Canadian Wildlife Service Library.

Publications are listed by author in alphabetical order. The subject index follows and it lists publications by author and publication date. Publications were identified by author and date of publication rather than by numbering because this method permits the user of the bibliography to insert new publications into the alphabetically-organized list without the need to renumber each publication.

ANNOTATED BIBLIOGRAPHY

Acorn, R. C. 1980. Coyote damage control in Alberta. Paper presented at C.P.M.S. 8 pp. (Author is Field Coordinator, Predator Damage Control, Alberta Agriculture, Edmonton.)
The handling of coyote damage complaints is described. Coyotes are confirmed as the problem predator, individual animals are destroyed, preventative measures are instituted and compensation paid.

Adamcik, R. S., A. W. Todd and L. B. Keith. 1978. Demographic and dietary responses of great horned owls during a snowshoe hare cycle. Can. Field-Nat. 92:156-166.
The demography and food ecology of the great horned owl was studied during a population cycle of the snowshoe hare near Rochester, Alberta. Non-breeding by territorial pairs and composition of diet varied with changes in snowshoe hare numbers.

Adams, L. 1959. An analysis of a population of snowshoe hares in northwestern Montana. Ecol. Monogr. 29:141-170.
An island population of snowshoe hares was studied in Montana. The correlation of pellet numbers and hare numbers, factors affecting distribution and abundance, reproduction, growth of young, sex ratios, home range size, foods, survival rate and predators are described.

Ahlgren, C. E. 1966. Small mammals and reforestation following prescribed burning. J. Forestry 64:614-618.
Small mammals were trapped over a three year period in (1) uncut jack pine forest, (2) logged pine forest and (3) logged pine forest which was burned one year after cutting. Deer mouse numbers were higher on burned tracts, than on unburned tracts. Red-backed voles were uncommon prior to burning. Vole numbers on the burned tract began their increase in the third year after the fire.

Aldous, S. E. and J. Manweiler. 1942. The winter food habits of the short-tailed weasel in northern Minnesota. J. Mammal. 23:250-255.
Stomach and intestinal contents of weasels were examined to describe the diet of the weasel. Mice and shrews made up 76.3% of the diet by volume. Weasel, fish, birds, porcupine, squirrels and hare were also recorded. Prey was taken in proportion to its abundance or availability.

Aleksiuk, M. 1968. Scent-mound communication, territoriality, and population regulation in beaver (Castor canadensis Kuhl). J. Mammal. 49:759-762.
The use of scent mounds by beaver is hypothesized to function in marking of territories of adjacent colonies and to prevent transient beavers from colonizing an occupied area. A beaver population is self-regulated if the transient beavers do not colonize an area and they are subject to high mortality.

Andelt, W. F. and P. S. Gipson. 1979. Home range, activity, and daily movements of coyotes. J. Wildl. Manage. 43:944-951.

Radiotelemetry was used to determine coyote home range, daily movements and daily activity cycles. The study was carried out in farmland in Nebraska.

Anonymous. 1975. Elk Island National Park. Natural Resources Analysis Workshop. Vol. II Report of Proceedings. Revised Edition. 48 pp.
Ideas and information on the natural resources of Elk Island National Park are summarized from workshop proceedings. Geology, climate, aquatic resources, vegetation, invertebrates, vertebrates and human history were examined. Widely varying amounts of information were available on these topics.

Anthony, E. L. P. and T. H. Kunz. 1977. Feeding strategies of the little brown bat, Myotis lucifugus, in southern New Hampshire. Ecology 58:775-786.
Aspects of feeding by little brown bats were studied in New Hampshire. Lactating bats consumed more food than pregnant bats which consumed more food than juveniles. Adult bats took prey insects in proportion to availability when food was relatively scarce but selected beetles and mayflies when food was abundant. Feeding by juveniles was nonselective.

Baker, R. H. 1940. Effect of burning and grazing on rodent populations. J. Mammal. 21:223.
The impact of burning and grazing on rodent populations was studied on prairie lands in Texas. Burning and grazing were blamed for a definite reduction in small mammal numbers. Burning was considered more destructive than grazing. Predation by raptors in association with fires was noted.

Baker, R. J. and S. L. Williams. 1972. A live trap for pocket gophers. J. Wildl. Manage. 36:1320-1322.
A live trap for pocket gophers is described. The trap is constructed from a modified rat trap and plastic pipe.

Banfield, A. W. F. 1946. Report on wildlife conditions in Elk Island National Park, 1946. Unpubl. Report. National Parks Bureau, Ottawa. 3 pp.
Observations of range conditions and numbers and condition of elk, moose, mule deer and bison were described. Muskrats were described as common in ponds and small lakes.

Bear, G. D. and R. M. Hansen. 1966. Food habits, growth and reproduction of white-tailed jackrabbits in southern Colorado. Colo. State Univ. Agric. Exp. Stat. Tech. Bull. 90. 59 pp.
Seasonal diet, food preference, habitat use, growth rate, food consumption and reproductive characteristics of the white-tailed jackrabbit were studied in Colorado. Shrubs were the major food items in winter and grasses and forbs were important throughout the rest of the year. Grassland habitat was used more than meadow, rabbit bush or sagebrush habitats.

Beck, A. M. and R. J. Vogl. 1972. The effects of spring burning on rodent populations in a brush prairie savannah. J. Mammal. 53:336-346.

Rodent populations were compared in areas burned two, four or 11 times in 15 years with areas which had not been burned in 35 years. While numbers of rodents did not vary among the areas examined, Peromyscus leucopus and Clethrionomys gapperi were common in the unburned oak forest and Peromyscus maniculatus and Spermophilus tridecemlineatus preferred the burned prairie.

Bekoff, M. (Ed.). 1978. Coyotes - biology, behavior, and management. Academic Press, New York. 384 pp.
This is a collection of papers on the coyote. Topics include taxonomy, pathology, reproduction, social behaviour, vocalization, habitat, ecology and management problems.

Bider, J. R. 1961. An ecological study of the hare Lepus americanus. Can. J. Zool. 39:81-103.
Range and movements of the snowshoe hare were studied in the Laurentians of Québec. Range was affected by vegetation structure (food and cover). Activity and movements were affected by weather and breeding condition.

Bird, R. D. 1930. Biotic communities of the aspen parkland of central Canada. Ecology 11:356-442.
Aspen parkland is described in terms of three major communities: prairie, willow and aspen. The plants, mammals, birds and invertebrates of each community are described. A close relationship between animal and plant components the communities is emphasized.

Bird, R. D. 1961. Ecology of the aspen parkland of western Canada. Can. Dept. of Agriculture Publication 1066. Ottawa. 155 pp.
The aspen parkland of the prairie provinces of Canada is described. Major plant communities, successional sequences, animal associations and relationships between human history and the ecology of the aspen parkland are discussed.

Birney, E. C., W. E. Grant and D. D. Baird. 1976. Importance of vegetative cover to cycles of Microtus populations. Ecology 57:1043-1051.
The hypothesis that a threshold amount of vegetative cover is necessary for a Microtus population to exhibit cyclic population changes is investigated. The significance of cover to small mammal populations is discussed.

Bjorge, R. R. 1977a. Population dynamics, denning and movements of striped skunks in central Alberta. MSc thesis, University of Alberta, Edmonton. 96 pp.
The ecology of striped skunks was studied in central Alberta from 1971 to 1974. Litter sizes were relatively small following a long, cold winter and large following a short, mild winter. Buildings were used intensively for denning. Dispersal of young occurred after weaning (mid-July to November) and dispersal direction favoured gently rolling farmland over hummocky, forested areas.

Bjorge, R. R. 1977b. Analysis of wolf scats and kills in the Peace River region of Alberta, 1975-1977. Alberta Recreation, Parks and Wildlife, Fish and Wildl. Div. Unpubl. Rep. 7 pp.
Wolf food habits were studied as part of wolf-livestock studies. Cattle was second to cervids in frequency of occurrence in scats collected in summer. In winter, the proportion of cattle and other food items in the wolf diet decreased from summer.

Bjorge, R. R., J. R. Gunson and W. M. Samuel. 1981. Population characteristics and movements of striped skunks (Mephitis mephitis) in central Alberta. Can. Field-Nat. 95:149-155.
Reproduction, survival and movements of the striped skunk are described from a study area around Tofield, Alberta. Early and late winter weather was suggested to influence survival and reproduction.

Bookhout, T. A. 1965. Feeding coactions between snowshoe hares and white-tailed deer in northern Michigan. Trans. N. Am. Wildl. Conf. 30:321-334.
Competition between hares and deer was examined by an analysis of browse. Hardwood habitat was preferred by deer in winter while hares preferred swamp conifer habitat. Competition was not significant for any abundant browse species in a given habitat.

Booth, E. S. 1946. Notes on the life history of the flying squirrel. J. Mammal. 27:28-30.
Birth, growth, development and gliding were described for a captive litter of flying squirrels.

Bouckhout, L. W. 1971. Assessment of browsing conditions in Elk Island National Park, Alberta. Unpubl. Rep. prep. for Can. Wildl. Serv., Edmonton. 56 pp.
Browsing conditions were studied in Elk Island National Park by examining results of aerial surveys for ungulates, general browse surveys and by examining browse conditions in ungulate exclosures. Browse utilization was high and was retarding succession to forest. Lower ungulate populations would result in reduced winter mortality but would not eliminate it.

Bowen, W. D. 1981. Variation in coyote social organization: the influence of prey size. Can. J. Zool. 59:639-652.
Coyote diet was studied by scat analysis in Jasper National Park from 1974-1977. Observations were made on pack size and hunting strategy. Summer diet was dominated by rodents (43%) and neonatal cervids (19%) while large ungulates (67%) dominated the winter diet. The amount of mule deer in the diet was related to coyote group size but the amount of elk in the coyote diet was unrelated to group size. Elk carrion was used. Coyote groups defended ungulate carcasses.

Bowen, W. D. 1982. Home range and spatial organization of coyotes in Jasper National Park, Alberta. J. Wildl. Manage. 46:201-216.

Distribution of coyotes in time and space, the effect of social and ecological factors on coyote use of space and the relationship between home range size and group size are discussed. Coyote home ranges varied in size with group size and tended to be used over a number of years. There was little overlap between ranges of neighbouring groups.

Bowker, L. S. and P. G. Pearson. 1975. Habitat orientation and interspecific interaction of Microtus pennsylvanicus and Peromyscus leucopus. Am. Midl. Nat. 94:491-496.
The structure of habitat and the interspecific behaviour of meadow voles and white-footed mice were studied in fields in New Jersey. Meadow voles clearly oriented to areas of dense vegetation. Mice occurred in areas of dense vegetation clumps surrounded by sparse vegetation and in areas with fewer voles.

Boyce, M. S. 1981. Habitat ecology of an unexploited population of beavers in interior Alaska. Worldwide Furbearer Conference Proc. 1:155-186.
Habitat in which beavers locate colonies was studied in Alaska. Habitats supporting colonies for only one year had less food tree biomass than habitats supporting colonies for two years. Colony density was positively correlated with the amount of stream branching, the amount of winter food plants and vegetation diversity. Use of heterogeneous habitats was explained by seasonal variability in food preferences.

Brand, C. J., L. B. Keith and C. A. Fischer. 1976. Lynx responses to changing snowshoe hare densities in central Alberta. J. Wildl. Manage. 40:416-428.
Changing densities, recruitment, home ranges, hunting behaviour and feeding habits of lynx were examined as responses to changing hare populations. Low hare populations were associated with low numbers of lynx kittens, early postpartum mortality of kittens, reduced conception rates among yearlings and switching to ruffed grouse as prey.

Brand, C. J. and L. B. Keith. 1979. Lynx demography during a snowshoe hare decline in Alberta. J. Wildl. Manage. 43:827-849.
Changes in lynx diet, fat deposits, reproductive condition, age structure and mortality are examined in relation to changes in hare numbers. Declining lynx numbers, proportion of hares in diet, body fat in late winter, pregnancy rates, litter sizes and proportion of kittens in the population accompanied declining numbers of hares.

Brink, C. H. and F. C. Dean. 1966. Spruce seed as a food of red squirrels and flying squirrels in interior Alaska. J. Wildl. Manage. 30:503-512.
Red squirrels and flying squirrels were fed white or black spruce cones in feeding trials. Red squirrels preferred white spruce over black spruce cones and survived on a diet consisting only of white spruce cones. Flying squirrels lost weight on a diet of white spruce seed only.

Brooks, R. P., M. W. Fleming and J. J. Kennelly. 1980. Beaver colony response to fertility control: evaluating a concept. J. Wildl. Manage. 44:568-575.
Breeding activity of beaver colonies was monitored following surgical sterilization (either tubal ligation or castration) of one adult in each of 13 colonies. Eleven of these colonies had no reproduction by beaver.

Brown, L. N. 1967. Ecological distribution of six species of shrews and comparison of sampling methods in central Rocky Mountains. J. Mammal. 48:617-623.
The habitat preferences of six species of shrews were studied using pitfall traps in southern Wyoming. The masked and vagrant shrews were widespread. Water shrews were restricted to habitats near ponds or streams and pigmy shrews were found only in peat-moss bogs.

Brown, L. N. 1970. Population dynamics of the western jumping mouse (Zapus princeps) during a four-year study. J. Mammal. 51:651-658.
The population dynamics of the western jumping mouse were studied in a willow-sedge bog in Wyoming. Densities were relatively stable from year to year. Winter mortality was higher among juveniles than adults and appeared to result from insufficient fat deposits. Home ranges were elongate and paralleled a stream.

Buckner, C. H. 1966. Populations and ecological relationships of shrews in tamarack bogs of southeastern Manitoba. J. Mammal. 47:181-194.
The natural history, ecological and population dynamics of shrews were studied by means of live-trapping. Arctic shrews preferred drier sites in the bogs. An inverse relationship between populations of masked and arctic shrews was demonstrated.

Buehler, D. A. and L. B. Keith. 1982. Snowshoe hare distribution and habitat use in Wisconsin. Can. Field-Nat. 96:19-29.
In the absence of young or low-growing conifers, low, dense, woody vegetation supported populations of snowshoe hares. It is suggested that hare populations are not cyclic where low, dense, woody vegetation occurs in patches or islands.

Burk, D. (Ed). 1979. The black bear in modern North America. Proc. Workshop on the Manage. Biol. of N. Am. Black Bear. Boone and Crocket Club and The Amwell Press, Clinton, New Jersey. 300 pp.
Reports on the status, management and problems with black bears are presented for American states and Canadian provinces. Black bears were described as abundant in Alberta and management was "not intensive".

Bush, A. O. and W. M. Samuel. 1981. A review of the helminth communities in beaver (Castor spp.) with a survey of Castor canadensis in Alberta, Canada. Worldwide Furbearer Conference Proc. 2:678-689.
The helminth fauna of the gastro-intestinal tract of beavers of central Alberta is described. A discussion of helminth faunas in C. canadensis and C. fiber is presented.

Butler, L. 1940. A quantitative study of muskrat food. Can. Field-Nat. 54:37-40.
A list of plants eaten by muskrat is presented. The study was conducted on a marsh in northern Manitoba.

Butterfield, R. T. 1954. Some raccoon and groundhog relationships. J. Wildl. Manage. 18:433-437.
Den trees, artificial denning boxes and ground dens were monitored for use by raccoons. Ground dens were used by raccoons as dens, maternal dens and as a refuge. A raccoon was the winner in a fight with a groundhog over a ground den.

Cairns, A. L. 1976. Distribution and food habits of moose, wapiti, deer, bison and snowshoe hare in Elk Island National Park, Alberta. M.Sc. thesis. Univ. of Calgary, Calgary. 169 pp.
Distribution of pellet groups and tracks in snow were used to describe the distribution of ungulates and the snowshoe hare. Food habits of the ungulates were studied by faecal analysis. Habitats of the park and habitats of the study species were described. Competition was assessed.

Carbyn, L. N. 1971. Identification and classification of small mammals. Workshop presented at 9th Annual Regional Warden 2 School, Jasper Nat. Park, 23 March 1971. 37 pp.
Bones of the mammalian skull are described. Dentition and dental formulas are explained. Notes for each family of mammals in Jasper National Park include a description of bone structure and natural history. A dichotomous key to the mammals of Alberta is included.

Carbyn, L. N. 1974. Wolf predation and behavioral interactions with elk and other ungulates in an area of high prey diversity. Can. Wildl. Serv. Rep. prep. for Parks Canada. 233 pp.
The predator-prey relationship between wolves and ungulates of Jasper National Park is described. Natural history of wolves was studied, prey distribution and numbers were surveyed and behaviour of predator and prey was observed.

Christian, J. J. 1956. The natural history of a summer aggregation of the big brown bat, Eptesicus fuscus fuscus. Am. Midl. Nat. 55:66-95.
A breeding colony of the big brown bat was studied in Maryland. Reproduction, adrenal gland changes and development and wear of dentition were described.

Clark, F. W. 1972. Influence of jackrabbit density on coyote population change. J. Wildl. Manage. 36:343-356.
The relationship between jackrabbit density and coyote demography is examined. The coyote population varied with its food base. The jackrabbit accounted for the majority of the food base.

Clothier, R. R. 1955. Contribution to the life history of Sorex vagrans in Montana. J. Mammal. 36:214-221.

Shrews were collected as part of a taxonomic study in western Montana. Habitat, daily activity cycles, food habits and reproductive parameters were described.

Cole, G. F. 1976. Management involving grizzly and black bears in Yellowstone National Park 1970-75. Nat. Res. Rep. No. 9. U.S. Dept. of the Interior, National Park Service. 26 pp.
Programs of removing sources of unnatural foods from bears and park visitor education were evaluated in terms of reducing bear-caused injuries to visitors, attaining natural feeding conditions and maintaining bear populations.

Cole, P. J. 1975. Analysis of the food habits of black bears in the Peace River area. 1974. Alberta Recreation, Parks and Wildlife, Fish and Wildlife Div., Unpubl. Rep. 12 pp.
Scat and stomach analysis was carried out on nuisance black bears in the Peace River area in 1974. Major food items were insects, grain or cereal crops and natural grasses. This report follows that of Norstrom (1974).

Conaway, C. H. 1952. Life history of the water shrew (Sorex palustris navigator). Am. Midl.-Nat. 48:219-248.
Aspects of the life history of the water shrew were studied in Montana. Habitat, growth, reproduction, food habitats, parasites and aspects of behaviour were described.

Conroy, M. J., L. W. Gysel and G. R. Dudderar. 1979. Habitat components of clear-cut areas of snowshoe hares in Michigan. J. Wildl. Manage. 43:680-690.
Winter tracking of snowshoe hares was used to examine relationships between hare activity and variables of habitat and weather. Habitat interspersion (diversity) and distance to lowland coniferous-hardwood habitat influenced hare activity. Hare activity was also high in shrubby edges of clear-cuts.

Constantine, D. G. 1982. Batproofing of buildings by installation of valvelike devices in entryways. J. Wildl. Manage. 46:507-513.
A method of excluding unwanted bats from buildings is described. Bats are allowed to leave the building through one-way tubes and then entrance holes are sealed. The key to this method is the use of a flexible tube as a valve preventing re-entry to the building.

Cook, S. F., Jr. 1959. The effects of fire on a population of small rodents. Ecology 40:102-108.
Use of grassland and brush habitats in California were examined following fire. A lack of cover in burned areas retarded colonization by small mammals and particularly by Microtus. Species found in burned brush habitat were more typical of grassland habitat.

Costello, D. F. 1966. The world of the porcupine. J. B. Lippincott Company, Philadelphia and New York. 157 pp.

This is a popular description of the natural history of the porcupine. Porcupine activities are described by season of the year. Economic status is discussed.

Cowan, I. McT. 1936. Nesting habits of the flying squirrel Glaucomys sabrinus. J. Mammal. 17:58-60.
Notes on the breeding and nests of flying squirrels are presented. Two nest types are described. Nests in abandoned woodpecker holes and other tree cavities were used primarily in winter. Outside, or dray type nests were used in summer as breeding nests.

Cowan, I. McT. and R. H. Mackay. 1950. Food habits of the marten (Martes americana) in the Rocky Mountain region of Canada. Can. Field-Nat. 64:100-104.
Food habits of marten in Banff, Jasper and Kootenay National Parks were interpreted from scats and stomach contents. Mice, squirrels, hares, pikas, shrews, carrion, birds, insects and berries composed the diet. Mice were the most important food item followed by squirrels.

Cranford, J. A. 1978. Hibernation in the western jumping mouse (Zapus princeps). J. Mammal. 59:496-509.
Hibernacula, fat disposition and metabolism, arousals and the role of soil temperature in hibernation were studied in Utah. Seed availability was critical for disposition of fat before hibernation. Emergence from hibernation was cued by rising soil temperature. Hibernacula were located in rich organic soils near a tree or large shrub.

Cranford, J. A. 1983. Ecological strategies of a small hibernator, the western jumping mouse Zapus princeps. Can. J. Zool. 61:232-240.
Studies on the hibernation, population density, home range size, reproduction, growth, diet and habitat preferences of the western jumping mouse were carried out in Utah at elevations ranging from 1860 m to 2900 m. Plant phenology was a good predictor of emergence from hibernation. One litter was produced per year averaging 4.7 young. Home-range size varied from 0.17 to 0.61 ha.

Criddle, S. 1939. The thirteen-striped ground squirrel in Manitoba. Can. Field-Nat. 53:1-6.
The natural history of the thirteen-lined ground squirrel was studied in Manitoba. Description of the animal includes its Manitoba distribution, appearance, size, behaviour, reproduction, foods, hibernation, burrowing and economic status.

Criddle, S. 1943. The little northern chipmunk in southern Manitoba. Can. Field.-Nat. 57:81-86.
Aspects of the natural history of the least chipmunk were described in southern Manitoba. Foods, nests, reproduction and hibernation were described.

Criddle, S. 1947. A nest of the least weasel. Can. Field-Nat. 61:69.

The nest of a least weasel is described. The nest had been constructed by a meadow vole and was lined with hair of the weasel's prey. Remains of meadow voles and red-backed voles were in the nest.

Cushwa, C. T. and K. P. Burnham. 1974. An inexpensive live trap for snowshoe hares. J. Wildl. Manage. 38:939-941.
A live trap for snowshoe hares is described. It is inexpensive, constructed from commonly available materials and requires about 30 minutes for construction. This trap is not collapsible.

Dagg, A. I. and C. A. Campbell. 1974. An annotated bibliography on the status and ecology of the wolverine in Canada. Can. Wildl. Serv. Manuscript Rep. 45 pp.
A bibliography of literature on wolverines in Canada is provided. Appendices include museum records, trapping records and references of translations of wolverine literature.

Davis, D. E. 1977. Role of ambient temperature in emergence of woodchucks (Marmota monax) from hibernation. Am. Midl. Nat. 97:224-229.
Dates of emergence of woodchucks from burrows was studied over a 13-year period in Pennsylvania. Termination of hibernation was determined by a circadian rhythm and the actual date of emergence related to daily temperatures.

Davis, D. E. (Ed). 1982. Census methods for terrestrial vertebrates. CRC Press, Inc. Boca Raton, Florida. 397 pp.
Recommended methods of estimating densities of amphibians, reptiles, birds and mammals are described by species. Most methods are designed to measure actual densities rather than develop indices of abundance.

Dekker, D. 1973. Red foxes make a comeback in central Alberta after 30 years. Blue Jay 31:43-44.
The status of the red fox in southern and central Alberta is described in the 1960s and early 1970s. A cyclic population decline and the widespread use of poison during a rabies outbreak were related to the decline. Recovery in numbers was linked to reduced coyote numbers which was caused by hunting from snowmobiles.

de Vos, A. 1951a. Overflow and dispersal of marten and fisher from wildlife refuges. J. Wildl. Manage. 15:164-175.
Trapping results were analysed in an area surrounding a game reserve in Ontario. Densities of fisher and marten captures decreased with increasing distance from the game reserve. Beaver, muskrat, mink, lynx, and other captures appeared to be unrelated to the reserve.

de Vos, A. 1951b. Recent findings in fisher and marten ecology and management. Trans. N. Am. Wildl. Conf. 16:498-507.

Movements, food habits and habitat preferences of fisher and marten are described from an Ontario study. Fishers generally travel in a circuit. Movements are affected by food availability, topography, cover, season and weather. Main winter foods of fisher are hare, porcupine, fish and mice. Fisher and marten are absent from recently cut or burned forests and fishers survive better in early stages of succession than marten.

de Vos, A. 1952. The ecology and management of fisher and marten in Ontario. Ontario Dept. Land and Forests Tech. Bull. 90 pp.
Status and results of an Ontario study into the biology and management of fisher and marten are described. Information concentrates on the fisher; marten data are added for comparison. Study topics include taxonomy, movements, behaviour, denning, diet, parasites, habitat, interspecific competition, populations and ageing techniques.

de Vos, A. 1964. Food utilization of snowshoe hares on Manitoulin Island, Ontario. J. Forestry 62:238-244.
A study of the feeding habits of hares was carried out to determine the impact of hare feeding on the distribution and abundance of plant species and to assess food shortage as a limit to population growth in hares. Food was not limiting at peak hare numbers. Trembling aspen, balsam poplar and sugar maple appeared most vulnerable to the feeding habits of hares.

Donohoe, R. W. 1966. Muskrat reproduction in areas of controlled and uncontrolled water-level units. J. Wildl. Manage. 30:320-326.
In Lake Erie marshes, various reproductive parameters of muskrats were compared in habitats with controlled versus uncontrolled water levels. Controlling of water levels did not affect reproductive parameters but mortality was reduced in controlled habitats.

Doherty, M.J. 1974. A preliminary ecological investigation of the soap hole area in Elk Island National Park. Unpubl. Report Prep. for Can Wildl. Serv. 83 pp.
The hydrology of the soap hole area was studied. Water levels, movements and chemistry as well as soils and vegetation were described. Interrelationships between these components were discussed. Wildlife use of the area was noted.

Dorney, R. S. 1954. Ecology of marsh raccoons. J. Wildl. Manage. 18:217-225.
Denning, habitat use and food habits of marsh raccoons were studied in Wisconsin. Ground dens were used and a shortage of tree dens did not limit the population. Important foods were corn in spring, crayfish and muskrat young in summer and corn, berries, crippled ducks and trapped muskrats in fall.

Dorward, W. J., D. B. Schowalter and J. R. Gunson. 1977. Preliminary studies of bat rabies in Alberta. Can. Vet. Jour. 18:341-348.

Among bats submitted for rabies testing, 4.7% were rabid. Rabid species were silver-haired bats, big brown bats, little brown bats and hoary bats. Rabies was found in 1.5% of little brown bats collected for this study.

Doucet, G. J. and J. R. Bider. 1974. The effects of weather on the activity of the masked shrew. J. Mammal. 55:348-363.
The numbers of crossings of a sand transect (activity) were compared under different weather conditions - temperature, humidity, barometric pressure, rainfall, cloud cover and wind direction and velocity. Time of rainfall, nocturnal cloud cover and nocturnal temperatures affected activity levels.

Eadie, W. R. 1953. Response of Microtus to vegetative cover. J. Mammal. 34:263-264.
Consumption of bait at grid stations in a timothy hay plot was used to determine the distribution of meadow voles on the plot. In areas where significantly less bait was taken vegetative cover was also significantly less than that in other areas of the plot.

Ealey, D. M., S. Hannon and G. J. Hilchie. 1979. An interim report on the insectivorous animals in the AOSERP study area. Prep. for the Alberta Oil Sands Environmental Research Program by McCourt Management Ltd. AOSERP Report 70. 294 pp.
Distribution, abundance in northeastern Alberta, food habits, foraging behaviour and habitat preferences of many insect, fish, bird, amphibian and mammal species were described based upon a literature review.

Edwards, R. Y. 1952. How efficient are snap traps in taking small mammals? J. Mammal. 33:497-498.
The efficiency and selectivity of snap traps and pitfall traps are discussed. Pitfall traps were considered effective in taking Napaeozapus, Zapus, Phenacomys, Synaptomys, Sorex and Microsorex. Snap traps captured Peromyscus, Clethrionomys, Microtus, Sorex and Blarina in numbers.

Englund, J. 1982. A comparison of injuries to leg-hold trapped and foot-snared red foxes. J. Wildl. Manage. 46:1113-1117.
Injuries sustained to teeth and legs by red foxes captured in unmodified leg-hold traps, leg-hold traps with plastic covering and a new foot-snare are reported. Plastic coverings on leg-hold traps reduced dental injuries but not injuries to the limbs. Use of a plastic-covered foot-snare was suggested to virtually eliminate injuries.

Errington, P. L. 1937. Summer food habits of the badger in northwestern Iowa. J. Mammal. 18:213-216.
The summer diet of the badger is described based upon observations of predation and diggings and upon scat analysis. Franklin's and thirteen-lined ground squirrels made up 53% of scat volume, mice (Microtus) made up 30% and insects made up 9%. Deer mice, birds and debris were also found in scats.

Fafarman, K. R. and R. J. Whyte. 1979. Factors influencing nighttime roadside counts of cottontail rabbits. J. Wildl. Manage. 43:765-767.
The influence of weather on roadside counts of rabbits was examined. Precipitation (rain) and moonlight were considered important factors.

Fala, R. A. 1975. Effects of prescribed burning on small mammal populations in a mixed-oak clearcut. J. Forestry 73:586-587.
The small mammal faunas of burned and unburned mixed-oak clear-cuts were compared. Deer mice invaded the burn after one month. Numbers of meadow voles and red-backed voles in the burned clear-cut equalled or exceeded numbers on the control clear-cut by the end of the second summer after the fire.

Felthauser, M. and D. McInroy. 1983. Mapping pocket gopher burrow systems with expanding polyurethane foam. J. Wildl. Manage. 47:555-558.
A method for the accurate mapping of burrow systems is described. Expanding polyurethane foam was pumped into a tunnel system, the foam hardened into a cast of the tunnel system and then the cast was excavaged by hand.

Fenton, M. B. 1983. Just Bats. University of Toronto Press, Toronto. 165 pp.
This text on bat biology is both popular literature and a good general reference on bats. Topics of sonar, reproduction, predators, parasites, diet, habitat, migration, energetics, roosting and rabies are treated.

Fenton, M. B. 1969. Summer activitiy of Myotis lucifugus (Chiroptera: Vespertilionidae) at hibernacula in Ontario and Québec. Can. J. Zool. 47:597-602.
Behaviour of little brown bats at hibernacula in late summer is described. In August, bats simply passed through hibernacula. In September, however, the hibernating population built up and mating occurred.

Ferguson, M. A. D. and H. G. Merriam. 1978. A winter feeding relationship between snowshoe hares and porcupines. J. Mammal. 59:878-880.
The significance of twigs, dropped by porcupines while feeding, to the snowshoe hare was examined. Twigs of the eastern white cedar dropped by porcupines constituted a significant amount of the hare diet in winter.

Fish, P. G. 1974. Notes on the feeding habits of Microtus ochrogaster and M. pennsylvanicus. Am. Midl. Nat. 92:460-461.
Meadow voles were found to have insects as 37 to 41% of stomach contents by volume. Adult Coleoptera and larval Lepidoptera were identified. Hard parts of insects occurred in 10% of the stomachs examined.

Fitzgerald, B. M. 1977. Weasel predation on a cyclic population of the montane vole (Microtus montanus) in California. J. Anim. Ecol. 46:376-397.
Predation by long-tailed and short-tailed weasels was studied. Short-tailed weasels fed almost exclusively on voles while long-tailed weasels fed on voles when abundant and switched to other prey when voles became scarce. Vole nests were used as weasel dens in winter.

Foster, J. B. 1961. Life history of the Phenacomys vole. J. Mammal. 42:181-198.
Observations on the life history of the phenacomys vole are reported and compared with that of Phenacomys intermedius. Development, nesting, breeding, habitat, food, predators and behaviour are described.

Fox, J. F. 1978. Forest fires and the snowshoe hare - Canada lynx cycle. Oecologia 31:349-374.
Forest succession following fire is proposed as the cause of the hare and lynx population cycles. Trapping records are compared with forest areas burned annually. Fires start a successional sequence where the amount of browse increases, hare numbers increase and lynx numbers increase. Snowfall appeared to explain variation not accounted for by fires.

Fox, M. W. (Ed). 1975. The wild canids - their systematics, behavioral ecology and evolution. Van Nostrand Reinhold Company, New York. 508 pp.
This is a collection of papers on wolves, foxes, dingoes, coyotes, jackals and dogs. Papers treat the taxonomy, genetics, morphology, ecology, behaviour and status of the wild canids.

Fritzell, E. K. 1978. Habitat use by prairie raccoons during the waterfowl breeding season. J. Wildl. Manage. 42:118-127.
Movements and habitat use by raccoons were studies by means of radiotelemetry in farmland of North Dakota during April to July. Building sites, wooded areas and wetlands were favoured habitats.

Fuller, T. K. and L. B. Keith. 1980a. Summer ranges, cover-type use, and denning of black bears near Fort McMurray, Alberta. Can. Field-Nat. 94:80-83.
Six radio-collared black bears were studied from June to October, 1976. Home range size, use of different vegetation types and denning were described.

Fuller, T. K. and L. B. Keith. 1980b. Wolf population dynamics and prey relationships in northeastern Alberta. Prep. for the Alberta Oil Sands Environmental Research Program by Dept. of Wildl. Ecol., Univ. of Wisconsin. AOSERP Report 102. 58 pp.
Movements, predation, food habits and mortality of wolves are described. The effect of man's activities on the wolves as well as the impact of wild predation on the moose population are recorded.

Fuller, T. K. and L. B. Keith. 1980c. Wolf population dynamics and prey relationships in northeastern Alberta. J. Wildl. Manage. 44:583-602.
Radiotelemetry and scat analysis were used to study wolf numbers, density changes, mortality factors, prey selection and the effects of disturbance on wolves.

Getz, L. L. 1961a. Factors influencing the local distribution of shrews. Am. Midl. Nat. 65:67-88.
Vegetation, food, cover, temperature, moisture and interspecific competition were examined as factors influencing the local distribution of Sorex cinereus and Blarina brevicanuda. Blarina occurred in areas which were moist but avoided areas with standing water or low food supplies. Sorex also occurred in moist habitats but was not restricted by food or standing water.

Getz, L. L. 1961b. Factors influencing the local distribution of Microtus and Synaptomys in southern Michigan. Ecology 42:110-119.
Vegetation, food, temperature, moisture, cover and interspecific competition were examined as factors influencing the local distribution of Microtus and Synaptomys. Microtus avoided habitats with woody shrubs and Synaptomys avoided standing water. Grasses or sedges and moisture were associated with both species.

Getz, L. L. 1961c. Notes on the local distribution of Peromyscus leucopus and Zapus hudsonius. Am. Midl. Nat. 65:486-500.
Vegetation type, cover, temperature, food, moisture and interspecific competition were examined as factors influencing the local distribution of Peromyscus and Zapus. Peromyscus used habitats with trees or shrubs. Zapus occurred in habitats which were moist or were near standing water.

Getz, L. L. 1965. Humidities in vole runways. Ecology 46:548-550.
Humidity was measured in meadow vole runways in a wet marsh and in a dry field. It was also measured in prairie vole runways. Absolute humidity in the dry field was significantly higher than in the marsh from 0800-1400 hr. No significant differences in humidity were found in other comparisions.

Getz, L. L. 1968. Influence of water balance and microclimate on the local distribution of the redback vole and white-footed mouse. Ecology 49:276-286.
Water balance and microclimate were examined as factors influencing habitat use by Clethrionomys gapperi and Peromyscus leucopus in southern New England. Microclimates of low swamps (vole habitat) and dry upland forest (mouse habitat) did not differ. Restriction of voles to low, wet habitat was related to the availability of free water in these habitats and the kidney of the vole which produces relatively dilute urine.

Getz, L. L. 1970. Habitat of the meadow vole during a "population low". Am. Midl. Nat. 83:455-461.

Meadow voles were found in small wet marshes in southern Wisconsin when the population was low. Various environmental parameters were compared in occupied versus unoccupied habitats. No parameter, which was measured, appeared to restrict the voles to the wet marsh habitat. Temperatures of the soil and air, vegetation cover and air soil moisture were measured.

Gilbert, F. F., S. A. Brown and M. E. Stoll. 1979. Semi-aquatic mammals: annotated bibliography. Prep. for the Alberta Oil Sands Environmental Research Program by Dept. of Zoology, Univ. of Guelph. AOSERP Report 59. 167 pp.
Literature on muskrat, beaver, mink and otter is classified by topics of life history, physiology, mortality factors, environmental quality and management.

Gipson, P. S. and J. A. Sealander. 1976. Changing food habits of wild Canis in Arkansas with emphasis on coyote hybrids and feral dogs. Am. Midl. Nat. 95:249-253.
Stomach contents of coyote hybrids, wild dogs and red wolves were examined in a study in Arkansas. Dietary habits are discussed in terms of changing farm size, changing canid species in the wild and shifts in agriculture from hog to poultry production. Canid diets varied with farm production and showed increased diet overlap among canid species.

Grant, P. R. and R. D. Morris. 1971. The distribution of Microtus pennsylvanicus within grassland habitat. Can. J. Zool. 49:1043-1052.
The distribution of meadow voles in grassland habitats was studied in Québec and Saskatchewan. At relatively low densities, vole distribution reflected the patchy habitat but, at higher vole densities, vole distribution became more uniform.

Grant, W. E. and E. C. Birney. 1979. Small mammal community structure in North American grasslands. J. Mammal. 60:23-36.
Small mammals were trapped in nine grassland types to study the relationship between habitat structure (e.g. cover, moisture, latitude, etc.) and the characteristics of the small mammal communities (e.g. species, biomass, reproductive strategy, life form, seasonality of activity, diet). Faunal differences between grassland habitats related to moisture and latitude.

Green, J. E. 1979. The ecology of five major species of small mammals in the AOSERP study area: a review. Prep. for the Alberta Oil Sands Environmental Research Program by LGL Ltd. AOSERP Report 72. 104 pp.
A synthesis of the literature describing the distribution, demography, habitat preferences and food habits of the red-backed vole, meadow vole, deer mouse, red squirrel and snowshoe hare is presented.

Green, J. E. 1980a. Small mammal populations of northeastern Alberta I. Populations in natural habitats. Prep. for the Alberta Oil Sands Environmental Research Program by LGL Ltd. AOSERP Report 107. 294 pp.
Small mammal populations, habitat use, diets and barking of woody vegetation were studied in forest habitats. Most rodents preferred balsam poplar and young successional habitats while hares preferred black spruce habitats. Barking damage on woody plants was mainly by hares and was highest in tamarack forests.

Green, J. E. 1980b. Small mammal populations of northeastern Alberta II. Populations in reclamation areas. Prep. for the Alberta Oil Sands Environmental Research Program by LGL Ltd., Environmental Research Associates. AOSERP Report 108. 136 pp.
Populations of small mammals, habitat use and damage to woody plants were studied in reclaimed habitats. Areas with grass and legume cover were suitable for meadow voles and deer mice. Damage to woody stems was associated with grass cover.

Gruell, G. E. 1980. Fire's influence on wildlife habitat on the Bridger-Teton National Forest, Wyoming. Volume II - Changes and causes, management implications. U.S.D.A. For. Serv. Res. Pap. INT-252, 35 pp. Intermt. For. and Range Exp. Stn., Ogden, Utah 84401.
Changes in vegetation following fire are interpreted in terms of wildlife habitat conditions. Impacts on mammal and bird species are considered.

Gunson, J. R. 1970. Dynamics of the beaver of Saskatchewan's northern forest. MSc thesis, University of Alberta, Edmonton. 122 pp.
Population dynamics of beavers were studied in 14 major habitat types in northern Saskatchewan. Number of beaver in colonies varied with habitat quality and appeared to be regulated by litter size variations and dispersal of immature beaver. Ovulation rates were higher in high quality habitats than in poor quality habitats where there were fewer poplars.

Gunson, J. R. and R. R. Bjorge. 1979. Winter denning of the striped skunk in Alberta. Can. Field-Nat. 93:252-258.
The winter dens of striped skunks were studied in an area from Tofield, Alberta east to the Alberta-Saskatchewan border. Den locations, movements around dens, time of den use and the numbers, sex and age of skunks occupying dens were described.

Gunson, J. R. and K. H. Dies. 1980. Sylvatic trichinosis in Alberta. J. Wildl. Dis. 16:525-528.
Surveys were conducted to determine the prevalence and distribution of the trichinosis in Alberta. Black bears, striped skunks and wolves were examined and only wolves from northern Alberta were infected. Earlier Alberta surveys found no infection in wolves, coyotes, cougars, wolverines, lynx, red foxes, martens and black bears.

Gunson, J. R. and D. B. Schowalter. 1975. About bats. Alberta Fish and Wildlife Div. Unpubl. Rep. 8 pp.
The purpose of this paper is to educate the public on bats, a group of animals which is poorly known and understood. Bats in general as well as the common species in Alberta are described. Bat rabies and other problems are discussed.

Hagueier, E. M. 1956. Distribution of marten and fisher in North America. Can. Field-Nat. 70:149-168.
A general description of the distribution of marten and fisher is followed by notes on distribution for each province and state where fisher or marten have been recorded.

Hall, R. L. and H. S. Sharp (Ed.). 1978. Wolf and man - evolution in parallel. Academic Press, New York. 210 pp.
This is a collection of papers which describe the development of wolf and human behaviour. Hunting behavior, social structure of packs, vocalization, scent-marking, taxonomy and ecology are discussed. The coyote is also included in some of the discussions.

Hamilton, W. J., Jr. 1935. Habits of jumping mice. Am. Midl. Nat. 16:187-200.
The natural history of Zapus and Napaeozapus was studied in New York State. Body size, habitat, hibernation, reproduction and foods are described.

Hansen, R. M. and J. T. Flinders. 1969. Food habits of North American hares. Colorado State Univ. Range Sci. Dept., Sci. Ser. No. 1. 18 pp.
The distribution, food habits and habitat use of the snowshoe hare, arctic hare, European hare and black-tailed and white-tailed jackrabbits are reviewed.

Harder, L. D. 1979. Winter feeding by porcupines in montane forests of southwestern Alberta. Can. Field-Nat. 93:405-410.
Feeding scars on trees in southwestern Alberta were used to study the pattern of forest use by porcupines and the characteristics of trees eaten by porcupines. Pure stands of Douglas fir in wind-protected locations were preferred for winter feeding. The faster growing trees were also preferred.

Harrington, F. H. and L. D. Mech. 1982. An analysis of howling response parameters useful for wolf pack censusing. J. Wildl. Manage. 46:686-693.
A radio-collared wolf population was used to assess the factors affecting the simulated howling method of wolf population census. Pack size, weather and type of simulated howl influenced the howling response. Census methods are described.

Harrington, F. H. and P. C. Paquet. (Ed.). 1982. Wolves of the world - Perspectives of behavior, ecology, and conservation. Noyes Publications, Park Ridge, New Jersey. 474 pp.

This collection of papers describes the ecology, social organization, movements, food habits, predator-prey relationships, population dynamics, status, management, behaviour and conservation problems of wolves in North America and Eurasia.

Hawley, V. D. and F. E. Newby. 1957. Marten home ranges and population fluctuations. J. Mammal. 38:174-184.
Home range size and population fluctuations of the marten were studied in Glacier National Park in Montana. Home range size averaged 0.92 square miles for males and 0.27 square miles for females. Juveniles and adult females were affected by population declines. Food was considered to be the limiting factor for the population.

Hendrickson, G. O. 1939. Inventory methods for Mearns cottontail. Trans. N. Am. Wildl. Conf. 4:209-215.
A pellet-count method is proposed as an efficient index of cottontail abundance. Defecation rates of caged animals were used with measurements of pellet densities in the wild to calculate the density of cottontails. Densities of counted pellets were also compared to numbers of flushed cottontails observed in a measured area.

Hilton, H. and N. P. Kutscha. 1978. Distinguishing characteristics of the hairs of the eastern coyote, domestic dog, red fox and bobcat in Maine. Am. Midl. Nat. 100:223-227.
Hairs of the coyote, dog, red fox and bobcat are described. Distinguishing characteristics of hair are the number, order and colour of bands, cross-sectional shape and translucence and the cuticular scale pattern.

Holmes, J. C. and R. Podesta. 1968. The helminths of wolves and coyotes from the forested regions of Alberta. Can. J. Zool. 46:1193-1204.
Wolves and coyotes from the northern and mountain parts of Alberta were examined for helminths. Helminth faunas were compared with those recorded in other North American studies. Helminths of wolves were similar throughout North America while those of coyotes varied with location. Diversity in parasite fauna was related to diversity in diet.

Hooven, E. F., H. C. Black and J.C. Lowrie. 1979. Disturbance of small mammal live traps by spotted skunks. Northwest Science 53:79-81.
Disturbance of live traps and predation on trapped animals was experienced during a small mammal population study in Oregon. The interference with the study was blamed on spotted skunks (Spilogale putorius). Disturbed traps had captured Peromyscus, Eutamias or Microtus.

Houston, C. S. and M. I. Houston. 1973. A history of raccoons in Saskatchewan. Blue Jay 31:103-104.

Records of raccoons are presented in a proposal that raccoons have been increasing in numbers in Saskatchewan since the 1920s. Early records came from areas near major river valleys while records were from more widespread locations.

Hornocker, M. G. and H. S. Hash. 1981. Ecology of the wolverine in northwestern Montana. Can. J. Zool. 59:1286-1301.
Live trapping, winter tracking and radio telemetry were used to study the habitat use, demography, movements and food habits of the wolverine. Management considerations are described.

Houseknecht, C. R. and J. R. Tester. 1978. Denning habits of striped skunks (Mephitus mephitus). Am. Midl. Nat. 100:424-430.
Based on 36 radio-collared skunks, dens and denning habits were described. Eight percent of located dens were in junk piles or buildings, 21% were in logs or trees and 71% were underground. Underground dens were used in winter but all den types were used in summer. Communal denning occurred in winter.

Howard, W. E. 1952. A live trap for pocket gophers. J. Mammal. 33:61-65.
Construction, baiting and setting of a live trap for pocket gophers is described. Advantages of the trap are described as its success rate, the ability to set the trap after being set into a burrow and the ability to check for captures without digging out the trap.

Humphrey, S. R. and J. B. Cope. 1976. Population ecology of the little brown bat, Myotis lucifugus, in Indiana and north-central Kentucky. Am. Soc. Mammal., Spec. Pub. No. 4. 81 pp.
Demography, migration patterns and habitat use is described for the little brown bat. Populations are classified and discussed in terms of nursery populations, shelter groups, swarming groups and winter populations.

Ingles, L. G. 1961. Home range and habitats of the wandering shrew. J. Mammal. 42:455-462.
Home range and the use of three habitats were studied in California. Shrews were found in habitat offering a continuous supply of food and cover. Home ranges averaged 4000 square feet in size and varied greatly in size, shape and overlap.

Iverson, S. L. and B. N. Turner. 1972. Natural history of a Manitoba population of Franklin's ground squirrels. Can. Field Nat. 86:145-149.
Hibernation period, reproduction, movements, weight changes, food habits and overwinter survival for Franklin's ground squirrels were described in a study area near Pinawa, Manitoba.

Jenkins, S. H. 1981. Problems, progress, and prospects in studies of food selection by beavers. Worldwide Furbearer Conference Proc. 1:559-579.
This is a literature review dealing with the feeding behaviour of beavers. Selection of plant species for feeding, temporal variation in preference for foods, tree size selection and location of feeding sites are discussed.

Johnson, G. R. 1976. Tularemia survey - Elk Island National Park - 1974, 1975, 1976. Alberta Agriculture, Veterinary Services Division. Edmonton. 18 pp. (mimeo).
Animal specimens were examined (post mortem) for tularemia. Water samples were also tested. Tularemia was diagnosed in two beaver specimens and was not found in water samples.

Jolly, G. M. and J. M. Dickson. 1983. The problem of unequal catchability in mark-recapture estimation of small mammal populations. Can. J. Zool. 61:922-927.
Properties of the "Jolly-Seber estimate" and the "minimum number alive" technique of estimating small mammal populations are compared. The minimum number alive technique of population estimation is shown to be biased under the assumption of equal catchability of small mammals.

Jones, E. N. and L. J. Sherman. 1983. A comparison of meadow vole home ranges derived from grid trapping and radiotelemetry. J. Wildl. Manage. 47:558-561.
Data on meadow vole home ranges were collected by grid trapping and radiotelemetry. Eight methods of calculating home range size were compared to find the method least influenced by the method of data collection. The convex area polygon method (Southwood 1966) was least affected by data collection method.

Jones, E. T. 1974. Sixteen Alberta bat records, 1971-1974. Blue Jay 32:244-245.
Locations in Alberta are listed where the hoary, silver-haired, big brown or small-footed bat were captured in mist nets.

Keith, L. B. 1965. Early notes on wildlife from New Serepta, Alberta. Can. Field-Nat. 79:29-34.
Notes on mammals and birds in the New Serepta area from 1907 to 1930s were extracted from family dairies. Wildlife use (food and furs) and changes in populations with increased agricultural land use are described.

Keith, L. B. 1966. Habitat vacancy during a snowshoe hare decline. J. Wildl. Manage. 30:828-832.
Distribution and reproductive parameters of a snowshoe hare population were studied during a cyclic decline. No differences in reproduction or mortality could be found in hares occupying abandoned versus occupied habitat. Hares were shifting from one habitat area to a more densely populated area.

Keith, L. B. (Ed). 1972. Annual report: Rochester Wildlife Research Center, 1972. Dept. Wildl. Ecol., Univ. of Wisconsin, Madison.
This is a collection of research reports on snowshoe hare, ruffed grouse and raptor populations studied near Rochester, Alberta. Research concerns cyclic populations and predator-prey interactions.

Keith, L. B., E. C. Meslow and O. J. Rongstad. 1968. Techniques for snowshoe hare population studies. J. Wildl. Manage. 32:801-812.
Live trapping methods (e.g. traps in runways, drive nets), marking methods (e.g. ear tattoo, web tag, fur dye), aging methods (e.g. lens weights, penis shape, teat length, body measurements, uterine characteristics) and other methods used in population studies were evaluated.

Keith, L. B. and D. C. Surrendi. 1971. Effects of fire on a snowshoe hare population. J. Wildl. Manage. 35:16-26.
The effects of a spring fire in aspen forest on the demography of snowshoe hare is examined. Hares were crowded into remaining unburned habitat and juvenile hares moved out of the study area during the breeding season.

Keith, L. B., A. W. Todd, C. J. Brand, R. S. Adamcik and D. H. Rusch. 1977. An analysis of predation during a cyclic fluctuation of snowshoe hares. Proc. Int. Cong. Game Biol. 13:151-175.
Responses of predators such as the lynx, coyote, great horned owl, goshawk and red-tailed hawk to changing numbers of snowshoe hares were studied over a ten-year period. Predation on ruffed grouse was compared with hare numbers and grouse numbers.

Kemp, G. A. and L. B. Keith 1970. Dynamics and regulation of red squirrel (Tamiasciurus hudsonicus) populations. Ecology 51:763-779.
Population dynamics of red squirrels in mixed forests were described near Rochester, Alberta. Population cycles were related to spruce cone crops and summer weather. Deciduous forests were used by juvenile squirrels where they were able to survive winter by feeding on seeds such as hazel nuts.

King, C. R. 1975. Analysis of coyote scats from Elk Island National Park. Unpubl. Special Project Report. N.A.I.T. Edmonton. 11 pp. (in Warden Service Library, E.I.N.P.).
Grasses, wood, deer, meadow vole, red squirrel, porcupine and birds were found in five coyote scats collected in Elk Island National Park in January 1975.

King, J. A. (Ed.). 1968. Biology of Peromyscus (Rodentia). Am. Soc. Mammal. Spec. Publ. No. 2. 593 pp.
This is a collection of papers describing the palaeontology, taxonomy, distribution, habitat, anatomy, development, pathology, genetics, home range, movements, population dynamics and activity patterns of deer mice.

Kirkland, G. L., Jr. 1976. Small mammals of a mine waste situation in the central Adirondacks, New York: A case of opportunism by Peromyscus maniculatus. Am. Midl. Nat. 95:103-110.
Poorly-vegetated mine wastes and nearby natural habitats were sampled for small mammals. Deer mice were abundant on the mine wastes and voles and shrews were effectively absent.

Kirkland, G. L., Jr. and R. J. Griffin. 1974. Microdistribution of small mammals at the coniferous-deciduous forest ecotone in northern New York. J. Mammal. 55:417-427.
Ecotones between upland coniferous, intermediate deciduous and lowland coniferous habitats were sampled for small mammals. Results were examined for habitat preferences of the small mammal species and for interspecific associations.

Kline, P. D. 1965. Factors influencing roadside counts of cottontails. J. Wildl. Manage. 29:665-671.
Time of year, time of day and various weather parameters were examined as factors affecting roadside counts of cottontail rabbits. Observations peaked in January-February and in June-July. Observations were highest before sunrise during winter and after sunrise during summer. Cloud cover, wind speed, nightly temperature drop and snow depth affected counts.

Klinghammer, E. (Ed.). 1975. The behavior and ecology of wolves. Garland STPM Press, New York. 588 pp.
Papers presented in this collection deal with a variety of wolf topics: Reports on the status of various populations, territorial behaviour, vocalization, genetics, hunting behaviour, introductions into new areas, law enforcement and habitat evaluation are presented.

Knowlton, F. F. 1972. Preliminary interpretations of coyote population mechanics with some management implications. J. Wildl. Manage. 36:369-382.
A population model for the coyote is described. The model is used in the development of effective strategies of coyote management.

Koehler, G. M. and M. G. Hornocker. 1977. Fire effects on marten habitat in the Selway-Bitterroot Wilderness. J. Wildl. Manage. 41:500-505.
Fire in the sub-alpine fir forests of Idaho is considered to benefit marten. Meadows and burns, while offering limited cover, contribute to the summer and fall diets of marten.

Kozlowski, T. T. and C. E. Ahlgren (Ed.). 1974. Fire and Ecosystems. Academic Press, New York. 542 pp.
The effects of fire on ecosystems are treated in two ways: One, components of ecosystems such as soil, soil organisms and vertebrates are examined in the context of fire, and two, the effects of fire on selected ecosystems are described. Fire is treated as both a natural event as well as in the role of a tool in land management.

Krebs, C. J. 1977. Competition between Microtus pennsylvanicus and Microtus ochrogaster. Am. Midl. Nat. 97:42-49.
Evidence of competition between two species of voles was not found in the grasslands of southern Indiana. Competition was not observed in enclosures supporting abnormally high vole densities. These voles appear to segregate on the basis of soil moisture.

Krebs, C. J., B. L. Keller and J. H. Myers. 1971. Microtus population densities and soil nutrients in southern Indiana grasslands. Ecology 52:660-663.
Soil analyses and vole trapping were carried out in fields of Indiana to test the hypothesis that peak microtine densities correlated with the abundance of sodium in the soil. No correlation was found. Cover was suggested as a predictor of peak densities.

Krefting, L. W. and C. E. Ahlgren. 1974. Small mammals and vegetation changes after fire in a mixed conifer-hardwood forest. Ecology 55:1391-1398.
One unburned and two burned areas were snap-trapped for 13 consecutive years following a forest fire. Deer mice were initially abundant but numbers declined. Red-backed voles increased in numbers with time.

Krefting, L. W., J. H. Stoeckeler, B. J. Bradle and W. D. Fitzwater. 1962. Porcupine-timber relationships in the Lake States. J. Forestry 60:325-330.
Porcupines were studied in Wisconsin to determine food preference, forest type preference, movements and damage to trees. Damage was greatest in northern hardwood-hemlock forest and pine forest. Densities were estimated to reach one porcupine per acre in concentrated areas. Most animals moved less than one mile during the study.

Kucera, E. and W. A. Fuller. 1978. A winter study of small rodents in aspen parkland. J. Mammal. 59:200-204.
Activity, behaviour, movement and mortality of small mammals of the aspen parkland were studied in relation to snow depth and temperature. Red-backed voles and deer mice occurred in forest and meadow voles occurred in fields. Red-backed vole mortality occurred in October before temperatures were below freezing and in February when temperatures were rising. Trap mortality of meadow voles was high throughout the winter. Deer mouse captures were few and mice may have been in torpor.

Kunz, T. H. and J. O. Whitaker, Jr. 1983. An evaluation of fecal analysis for determining food habits of insectivorous bats. Can. J. Zool. 61:1317-1321.
Little brown bats were fed insects of known taxa, numbers, and weights and then faecal pellets were independently analysed. Results of the faecal analysis repeated the list of foods in terms of having the same four most abundant insect taxa when measured as percent volume or as percent frequency.

Laidlaw, G. W. J. and M. B. Fenton. 1971. Control of nursery colony populations of bats by artifical light. J. Wildl. Manage. 35:843-846.

The effect of electric lighting in nursery colonies of big brown and little brown bats was assessed. Bat numbers declined by 41 to 96 percent after nurseries were illuminated. This appears to provide a safe, clean and efficient method of controlling populations of the "household bats".

Lampe, R. P. 1982. Food habits of badgers in east central Minnesota. J. Wildl. Manage. 46:790-795.
Food habits of badgers in Minnesota were determined by analysis of scats and stomach contents. Pocket gophers were the major prey item. Peromyscus, Microtus and Clethrionomys were taken irregularly but in significant numbers.

Larson, J. S. and F. C. van Nostrand. 1968. An evaluation of beaver aging techniques. J. Wildl. Manage. 32:99-103.
Revisions of the dental aging technique for beaver are presented. Other methods of estimating the age of beavers using pelt size and weight, skull measurements or external morphological measurements were found to be reliable only in separating young-of-the-year animals from the remainder of the population.

Laundré, J. W. and B. L. Keller. 1983. Trappability of coyotes relative to home range boundaries. Can. J. Zool. 61:1932-1934.
Susceptibility to capture was compared for coyotes in their home range to coyotes outside their home range. Trapping success did not increase toward the boundary of a home range or outside of the home range.

Lensink, C. J., R. O. Skoog and J. L. Buckley. 1955. Food habits of marten in interior Alaska and their significance. J. Wildl. Manage. 19:364-368.
In Alaska, microtine rodents, berries and birds were identified as the main foods of marten. Movements of marten were associated with the location of food.

Leonard, R. D. 1980. The distribution and abundance, food habits, and interspecific relations of the snowshoe hare during winter 1978-79 in Riding Mountain National Park. Large Mammal Systems Studies Report No. 9, Parks Canada. 95 pp.
Food habits, habitat use, abundance and potential for food competition with ungulates were studied in winter.

Lindzey, F. G., S. K. Thompson and J. I. Hodges. 1977. Scent station index of black bear abundance. J. Wildl. Manage. 41:151-153.
Scent stations are described as "a feasible means of indexing black bear abundance." The scent stations and the relative index are described.

Lindzey, F. G. 1978. Movement patterns of badgers in northwestern Utah. J. Wildl. Manage. 42:418-422.
Movements of badgers were studied by means of radiotelemetry. Home ranges and movements of females with cubs were described.

Linhart, S. B. 1981. Field evaluation of techniques for reducing coyote predation on livestock. Worldwide Furbearer Conference Proc. 3:1826-1838.
The study of coyote damage control methods is discussed. Factors which affect such studies and the pitfalls of published studies are described.

Linhart, S. B. and F. F. Knowlton. 1975. Determining the relative abundance of coyotes by scent station lines. Wildl. Soc. Bull. 3:119-124.
The use of scent station lines was tested in an effort to assess the relative abundance of coyotes in situations of large survey areas and limited manpower and funds. The month of September was chosen for the survey and commercial fermented-egg product for scent attractant. Other mammal species were also recorded at the stations.

Lishak, R. S. 1976. A burrow entrance snare for capturing ground squirrels. J. Wildl. Manage. 40:364-365.
Advantages, construction and use of a snare for the capture of ground squirrels at burrow entrances are described.

Lishak, R. S. 1977. Censusing 13-lined ground squirrels with adult and young alarm calls. J. Wildl. Manage. 41:755-759.
Use of adult alarm calls (tape recorded) and young alarm calls (simulated) is proposed as a census technique for thirteen-lined ground squirrels. This method permits a determination of reproductive success and population growth.

Liskop, K. S., R. M. F. S. Sadleir and B. P. Saunders. 1981. Reproduction and harvest of wolverine (Gulo gulo) in British Columbia. Worldwide Furbearer Conference Proc. 1:469-477.
Reproductive data were collected from trapped specimens. Females matured at two years of age and males over three years were mature. Mean litter size was 2.60 embryos.

Long, C. A. 1972. Notes on habitat preference and reproduction in pigmy shrews, Microsorex. Can. Field-Nat. 86:155-160.
Records of pigmy shrews with habitat information or reproductive statistics are presented. Pigmy shrews tended to occur in boreal mesic habitats. They occurred in drier habitats at peak populations but were never far from water.

Ludwig, J. and D. E. Davis. 1975. An improved woodchuck trap. J. Wildl. Manage. 39:439-442.
Modifications to conventional box traps for more effective capture of woodchucks are described. Changes are intended to reduce numbers of escapes from traps.

Mackenzie, K. 1976. Literature review of the coyote Canis latrans. Canadian Wildlife Service internal report for Dr. L. N. Carbyn. Mimeo. 42 pp.

A preliminary literature review describes aging techniques, breeding, hybridization, movements, parasites, diseases, control measures, food and predation by coyotes. A bibliography is included.

Marshall, W. H. 1946. Winter food habits of the pine marten. J. Mammal. 27:83-84.
Important items in the diet of marten in Montana were listed: red squirrel, flying squirrel, red-backed vole, and snowshoe hare. Lesser amounts of deer carrion, birds, insects, lichens and grasses were found.

Marshall, W. H. 1951. Pine marten as a forest product. J. Forestry 49:899-905.
Marten were studied by tracking in snow near Boise, Idaho. Habitat use, movements, food habits, reproduction and trapping are described.

Marshall, W. H., G. W. Gullion and R. G. Schwab. 1962. Early summer activities of porcupines as determined by radio-positioning techniques. J. Wildl. Manage. 26:75-79.
Movements and activities of porcupines in bogs and conifer-hardwood forests of Minnesota were studied by radiotelemetry. One animal was found in spruce bog and another located in aspen-maple upland forest. Animals observed feeding consumed deciduous tree leaves.

Marston, R. B. and O. Julander. 1961. Plant cover reductions by pocket gophers following experimental removal of aspen from a watershed area in Utah. J. Forestry 59:100-102.
Perennial plant cover decreased unexpectedly following the removal of aspen from a watershed area. Dead plants were undermined by pocket gophers and roots and crowns were eaten. Pocket gopher mounds were twice as common in areas where aspen was removed compared to untreated areas.

Martell, A. M. 1979. Relative efficiencies of Museum Special, Victor, and Holdfast traps for sampling small mammal populations. Can. Field-Nat. 93:313-315.
Biases associated with trap type used in sampling population of small mammals were assessed. Traps differed in proportions of species in catches and average weight of animals in catches.

McCabe, T. R. and M. L. Wolfe. 1981. Muskrat population dynamics and vegetation utilization: a management plan. Worldwide Furbearer Conference Proc. 2:1377-1391.
A vegetation utilization index is proposed as a relative density index for muskrats. Grazed stems below a specified height were counted on transects. Sampling two percent of the habitat gave a result within 10 percent of the population.

McCarley, H. 1966. Annual cycle, population dynamics and adaptive behavior of Citellus tridecemlineatus. J. Mammal. 47:294-316.

A marked population of thirteen-lined ground squirrels was studied in northern Texas. Sex ratios, litter sizes, duration and timing of hiberation, home range size, survival, population regulation and behaviour were studied.

McComb, W. C. 1981. Effects of land use upon food habits, productivity, and gastro-intestinal parasites of raccoons. Worldwide Furbearer Conference Proc. 1:642-651.
Body weights, foods, litter sizes and parasites of raccoons were compared by habitat type in which the animal was collected. Weights, parasites and proportions of animal and plant foods did not vary between habitats. Urban raccoons were less productive than those of agricultural or forested habitats.

McDonnell, J. A. and F. F. Gilbert. 1981. The responses of muskrats (Ondatra zibethicus) to water level fluctuations at Luther Marsh, Ontario. Worldwide Furbearer Conference Proc. 2:1027-1047.
Effects of annual fluctuations in water levels on muskrat populations were studied. Water levels dropped over the summer but family groups located in shallow water did not emigrate to find deeper water until fall freeze-up. The amount of muskrat in mink diets increased in fall as marsh bottoms were exposed.

McKeever, S. 1960. Food of the northern flying squirrel in northeastern California. J. Mammal. 41:270-271.
Stomach contents are reported for 24 flying squirrels captured in coniferous forests of northeastern California. Lichens were the dominant winter food and fungi were the dominant summer food. Conifer seed was available but was not eaten.

M'Closkey, R. T. and B. Fieldwick. 1975. Ecological separation of sympatric rodents (Peromyscus and Microtus). J. Mammal. 56:119-129.
Diet overlap and habitat structure of sympatric meadow voles and white-footed mice were studied to explain the ecological separation of these two species. Diet similarity was minimal. Habitat separation was based on foliage profile diversity, tree density and grass depth.

M'Closkey, R. T. 1975. Habitat succession and rodent distribution. J. Mammal. 56:950-955.
The relationship between meadow vole and white-footed mouse distribution and habitat structure is examined. Voles were found in grasslands with low foliage height diversity, while mice were found in shrubby, forest habitats with high foliage height diversity. Habitats intermediate between grassland and forest with intermediate foliage height diversity were dominated by the white-footed mouse.

McManus, J. J. 1974. Bioenergetics and water requirements of the redback vole, Clethrionomys gapperi. J. Mammal. 55:30-44.

The effects of temperature on food consumption, metabolism and water requirements of the redbacked vole were studied under laboratory conditions. Water requirements increased above and below 15°C. Food consumption was inversely related to temperature between 10° and 30°C.

Mech, L. D. 1966. The wolves of Isle Royale. Fauna of the Nat. Parks of the U.S. Fauna Ser. 7. 210 pp.
The relationship between wolves and moose of Isle Royale is described. Population dynamics of the wolf and moose were investigated. Natural history and behaviour of the wolf are described. A dynamic equilibrium in the moose and wolf populations was seen on the island and a stable predator-prey relationship was predicted.

Mech, L. D. 1970. The Wolf: the ecology and behavior of an endangered species. The Natural History Press, Garden City, New York. 384 pp.
Personal research by the author as well as existing literature contribute to this description of wolf ecology and behaviour. Topics discussed include the pack, territoriality, vocalization, reproduction, denning, development of pups, movements, predation, hunting behaviour, consequences of wolf predation, compatibility with other carnivores, parasites and the relations with man.

Mech, L. D. 1974. Current techniques in the study of elusive wilderness carnivores. Int. Cong. Game Biol. 11:315-322.
The use of live-trapping, radio-tagging and ground or aerial radio-tracking for the study of the wolf, lynx, fisher, marten and bears was described. These techniques permit the study of home range, dispersal, denning and various aspects of behaviour.

Meslow, E. C. and L. B. Keith. 1966. Summer food habits of red-tailed hawks near Rochester, Alberta. Can. Field-Nat. 80:98-101.
Food habits of red-tailed hawks were studied at nests by examination of remains in the nests and in pellets. Prey was dominated by Richardson's ground squirrels and snowshoe hares but included a diversity of bird and mammal prey. Other mammalian prey included the pocket gopher, mice, Franklin's ground squirrel, least weasel, short-tailed weasel and least chipmunk.

Meslow, E. C. and L. B. Keith. 1968. Demographic parameters of a snowshoe hare population. J. Wildl. Manage. 32:812-834.
Demographic factors of a snowshoe hare population were studied over a seven-year period near Rochester, Alberta. Changes in population size were related to adult and juvenile survival and reproductive factors such as pregnancy rate, litter size and length of breeding season.

Meslow, E. C. and L. B. Keith. 1971. A correlation analysis of weather versus snowshoe hare population parameters. J. Wildl. Manage. 35:1-15.

Correlations between weather factors and demographic parameters of the snowshoe hare at Rochester, Alberta were examined. Litter size and adult survival correlated with winter temperatures and snow depth. Survival of the first litter and second litter correlated with temperatures and rainfall respectively.

Messick, J. P. and M. G. Hornocker. 1981. Ecology of the badger in southwestern Idaho. Wildl. Monogr. No. 76. 53 pp.
This study of badger ecology was carried out in Idaho in shrub-steppe habitat. Topics of density, sex ratios, age structure, fecundity, mortality, movement, activity and food habits are discussed. Home ranges averaged 2.4 km^2 for adult males and 1.6 km^2 for adult females.

Michener, D. R. 1974. Annual cycle of activity and weight changes in Richardson's ground squirrel, Spermophilus richardsonii. Can. Field-Nat. 88:409-413.
Annual cycles of activity, reproduction, growth and weight changes were described for Richardson's ground squirrels in southern Saskatchewan.

Michener, G. R. and D. R. Michener. 1973. Spatial distribution of yearlings in a Richardson's ground squirrel population. Ecology 54:1138-1142.
The spatial distribution of yearlings with respect to their mothers was observed following hibernation. Yearling females tended to remain within the area of their mother's home range while yearling males of surviving mothers dispersed from their mother's home range.

Michener, G. R. and D. R. Michener. 1977. Population structure and dispersal in Richardson's ground squirrels. Ecology 58:359-368.
Sex and age structure and dispersal were studied in a population of Richardson's ground squirrels in southern Saskatchewan. Equal numbers of males and females were born. More males disappeared from the population than females. Males moved further than females when dispersing.

Miller, D. H. and L. L. Getz. 1977a. Comparison of population dynamics of Peromyscus and Clethrionomys in New England. J. Mammal. 58:1-16.
The population dynamics of deer mice and red-backed voles were studied in swamp and upland habitats of Vermont and Connecticut in conjunction with habitat studies. Greater annual fluctuations in small mammal abundance in upland habitats as compared to swamp habitat was related to similar variations in food supply in these habitats.

Miller, D. H. and L. L. Getz. 1977b. Factors influencing local distribution and species diversity of forest small mammals in New England. Can. J. Zool. 55:806-814.

Soil moisture and cover by vegetation and debris were studied as factors affecting the distribution of small mammals in Vermont and Connecticut. Deer mice were abundant in areas with less herbaceous cover. Red-backed voles were more abundant in moist areas.

Miller, R. S. 1964. Ecology and distribution of pocket gophers (Geomyidae) in Colorado. Ecology 45:256-272.
The habitats of and nature of competition between four species of pocket gophers were studied in Colorado. Distribution of the four species was determined by soil conditions and the degree of specialization in a given niche.

Milner, B. J. 1977. Vegetation analysis of ungulate range exclosures, Elk Island National Park. Unpubl. Report. Prep. for Parks Canada. Can. Wildl. Serv., Edmonton, Alberta. 95 pp.
Vegetation in four aspen forest exclosures and one grassland exclosure was compared with vegetation in unfenced areas. Aspen attained greater heights and diameters, shrub heights and diameters were greater, and herb cover was greater in the exclosures than in control areas.

Morris, R. D. 1969. Competitive exclusion between Microtus and Clethrionomys in the aspen parkland of Saskatchewan. J. Mammal. 50:291-301.
Microtus and Clethrionomys exhibited clear habitat separation in the aspen parkland of Saskatchewan during summer. In late fall, both species were found in the aspen forest. Microtus was found in aspen forest in summer when Clethrionomys was absent.

Murie, A. 1961. Some food habits of the marten. J. Mammal. 42:516-521.
Food habits of marten were examined by an analysis of scats from Wyoming. Voles and berries were important food items. Deer mice and shrews were avoided.

Murie, J. O. 1973. Population characteristics and phenology of a Franklin ground squirrel (Spermophilus franklinii) colony in Alberta, Canada. Am. Midl. Nat. 90:334-340.
The seasonal cycle of activity, weight changes, population density, sex ratios, reproduction and survival of Franklin's ground squirrels were studied at Miquelon Lakes Provincial Park in Alberta.

Murie, O. J. 1945. Notes on coyote food habits in Montana and British Columbia. J. Mammal. 26:33-40.
Food habits of coyotes were studied in interior British Columbia and Montana by scat collection and analysis. The B.C. diet was dominated by snowshoe hare but also included other mammals, birds, fish, insects and vegetable matter. In Montana, the snowshoe hare, cottontail rabbit and Columbian ground squirrel were important diet items. Elk calves were also found in the diet.

Mutch, G. R. P. 1977. Locations of winter dens utilized by striped skunks in Delta Marsh, Manitoba. Can. Field-Nat. 91:289-291.

Locations of winter dens of skunks were found by tracking skunks in snow. Dens were found in low-lying, wet areas rather than in a dike or a sandy ridge. Snow depth and soil temperature in the low-lying areas were thought to favour skunk denning.

Mutch, G. R. P. and M. Aleksiuk. 1977. Ecological aspects of winter dormancy in the striped skunk (Mephitus mephitus). Can. J. Zool. 55:607-615.
Seasonal changes in skunk activity and body temperature were studied at the northern limit of its distribution in Manitoba to investigate the winter survival strategy of the skunk. Skunks stored fat during warm months and conserved energy in cold months by becoming inactive, by decreasing metabolic rate and by occupying a warm den.

Nagy, J. A. and R. H. Russell. 1978. Ecological studies of the boreal forest grizzly bear (Ursus arctos L.) -- Annual Report for 1977. Unpubl. Can. Wildl. Serv. Rep. 72 pp.
The ecology of the grizzly bear and the black bear was studied in the Swan Hills area of Alberta. Pelage colouration, body weight, growth, reproduction, food habits, causes of mortalities, population densities and home range size are described. Relationships between the bear species and between man and the bears are discussed in terms of population trends.

Nash, J. B. 1951. An investigation of some problems of ecology of the beaver Castor canadensis Kuhl, in northern Manitoba. M.Sc. thesis, Univ. of Manitoba, Winnipeg. 64 pp.
Factors related to the increase in beaver populations in northern Manitoba were investigated. The effects of fire on spruce forest, food supply, trapping, predation, parasites and disease were examined.

Negus, N. C. 1950. Habitat adaptability of Phenacomys in Wyoming. J. Mammal. 31:351.
Phenacomys were trapped in habitats other than the typical timberline habitats. Heather voles were trapped in sagebrush at 6700 feet above sea level, along a stream at the edge of a spruce-fir forest and in a rocky clearing in spruce-fir forest.

Negus, N. C. and J. S. Findley. 1959. Mammals of Jackson Hole, Wyoming. J. Mammal. 40:371-381.
Mammals were trapped and observed in a variety of habitats in the vicinity of Jackson Hole, Wyoming. Species accounts are presented and describe the habitats occupied by each mammal species.

Nellis, C. H. 1968. Some methods for capturing coyotes alive. J. Wildl. Manage. 32:402-405.
Construction and use of a snare for the live-capture of coyotes is described. The use of snowmobiles to pursue, fatigue and capture coyotes is also described.

Nellis, C. H. 1969. Productivity of Richardson's ground squirrels near Rochester, Alberta. Can. Field-Nat. 83:246-250.
Sex ratios, breeding dates, litter sizes and intrauterine losses in the Richardson's ground squirrel were studied near Rochester, Alberta. Litter size varied from 4 to 13. Average litter size at birth was about eight.

Nellis, C. H., S. P. Wetmore and L. B. Keith. 1972. Lynx-prey interactions in central Alberta. J. Wildl. Manage. 36:320-329.
The relationship between lynx and its prey was studied during winter and during a low in the hare cycle. Snowshoe hares made up most of the diet of the lynx. Lynx predation accounted for about 20 percent of winter mortality among snowshoe hares and ruffed grouse.

Nellis, C. H. and L. B. Keith. 1968. Hunting activities and success of lynxes in Alberta. J. Wildl. Manage. 32:718-722.
Hunting activities of the lynx near Rochester, Alberta are described in terms of distance of travel each night, rate of success at killing snowshoe hares and ruffed grouse, frequency of kills and diet composition in winter.

Nellis, C. H. and L. B. Keith. 1976. Population dynamics of coyotes in central Alberta, 1964-68. J. Wildl. Manage. 40:389-399.
Foods, movements, densities, reproduction and survival of coyotes are described for a study area near Rochester, Alberta.

Norstrom, W. 1974. Stomach content analysis of 44 black bears; Peace River area - 1973. Alberta Dept. Lands and Forests, Fish and Wildlife Div. Unpubl. Wildl Invest. Prog. Rep. 10 pp.
Stomach contents of black bears taken in a bear damage evaluation and control program were analysed. Contents were dominated by bees, honey, larvae and wax but ants and cereal crops were also eaten. Use of beehive material was lowest when wild berries were available in July.

Norstrom, W. 1979. The beaver culvert experiment. Alberta Fish and Wildl. Div. Unpubl. Rep. 7 pp.
The effectiveness of using perforated pipe in beaver dams to reduce flooding was examined at three sites in the Peace River area. Results included (1) controlled water levels, (2) pond abandonment by beavers and (3) insufficient culvert capacity during heavy rains.

Northcott, T. H. 1971. Winter predation of Mustela ermines in northern Canada. Arctic 24:141-143.
Stomach contents of weasels trapped near Grande Prairie, Alberta and Fort Providence, N.W.T. were analysed. Zapus hudsonius, Peromyscus maniculatus, and Microtus pennsylvanicus were the main diet constituents.

Novak, M. 1977. Determining the average size and composition of beaver families. J. Wildl. Manage. 41:751-754.

Use of trapped samples of beavers is proposed for the estimation of average colony size and the age structure of colonies in the trapping area.

Ogilvie, R. T. and T. Furman. 1959. Effect of vegetational cover of fence rows on small mammal populations. Ecology 40:140-141.
Small mammals were sampled along fences between tilled fields in vegetation described as shrubby, weedy or bare. Deer mice were found in all three vegetation types while voles (Microtus montanus) were most abundant along weedy fence rows.

Packard, F. M. 1940. Beaver killed by coyotes. J. Mammal. 21:359-360.
Evidence around a beaver carcass was interpreted as coyote predation.

Parker, G. R. 1980. Winter habitat use and hunting activities of lynx (Lynx canadensis) on Cape Breton Island, Nova Scotia. Worldwide Furbearer Conference Proc. 1:221-248.
Winter tracking was used to study habitat use and predation by lynx. Lynx travelled mainly in mature conifer habitats. Winter prey was dominated by snowshoe hares.

Parker, G. R., J. W. Maxwell, L. D. Morton and G. E. J. Smith. 1983. The ecology of the lynx (Lynx canadensis) on Cape Breton Island. Can. J. Zool. 61:770-786.
Reproduction, diet, movements, home ranges, habitat use, impacts of forest harvesting and management of lynx are discussed. The study was carried out on Cape Breton Island, Nova Scotia and included radiotelemetry of lynx, live trapping of snowshoe hares, trapping of small mammals, autopsy of lynx carcasses collected from trappers and tracking in winter.

Patric, E. F. and W. L. Webb. 1953. A preliminary report on intensive beaver management. Trans. N. Am. Wildl. Conf. 18:533-539.
Management by limiting the harvest is described as extensive management. Intensive management is proposed for beaver. This implies forest management for beaver production and harvesting surplus animals every year. It requires a thorough knowledge of forest succession and of the relationship between the beaver population and forest succession.

Pearson, A. M. 1960. A study of the growth and reproduction of the beaver (Castor canadensis Kuhl) correlated with the quality and quantity of some habitat factors. M.Sc. thesis. Univ. of British Columbia, Vancouver. 103 pp.
A study of the beaver in Prince Albert National Park was carried out to evaluate the hypothesis that an animal's condition, measured by growth and reproduction, reflects the quality of its environment. Beaver reproduction in Prince Albert National Park was compared with that in Elk Island National Park.

Pearson, A. M. and D. R. Flook. 1958. A comparison of litter sizes in beaver in Prince Albert National Park, Saskatchewan and Elk Island National Park, Alberta. Unpubl. Report, Can. Wildl. Serv., Edmonton, Alberta. 9 pp.
Average litter size of beaver in Elk Island National Park (6.3 in 1958) was larger than that in Prince Albert National Park (3.5 in 1954-58). Difference in litter size between the two parks was related to differing stages in population growth - rapid growth phase versus peak population phase.

Pease, J. L., R. H. Vowles and L. B. Keith. 1979. Interaction of snowshoe hares and woody vegetation. J. Wildl. Manage. 43:43-60.
Snowshoe hares near Rochester, Alberta were experiencing a food shortage during a cyclic peak in numbers. Depletion of quality browse (twigs with diameters less that 3-4 mm) was suggested as the cause for the cyclic decline.

Penner, D. F., K. H. McCourt and K. E. Smyth. 1980. A review and assessment of the baseline data relevant to the impacts of oil sands development on black bears in the AOSERP study area. Prep. for the Alberta Oil Sands Environmental Research Program by McCourt Management Ltd. AOSERP Report 65. 52 pp.
Available black bear data are examined in the context of oil sand development. Population dispersion, potential impacts of development and population dynamics are discussed. Knowledge gaps preventing a complete assessment of development impacts on bears are noted.

Peterson, R. O. 1977. Wolf Ecology and Prey Relationships on Isle Royale. U.S. Park Serv. Sci. Monogr. Ser. No. 11. 210 pp.
The ecology of the wolf and the population dynamics of the principle prey of the wolf, the moose, are described from studies on Isle Royale. Winter travel and hunting, social behaviour in packs, breeding, territoriality, vocalization, denning and relationships with foxes and coyotes are included in the discussion of wolf ecology.

Pietz, P. J. and J. R. Tester. 1983. Habitat selection by snowshoe hares in north central Minnesota. J. Wildl. Manage. 47:686-696.
Habitat use by hares was studied by means of radiotelemetry, track surveys, pellet counts and browse surveys. All open habitats were avoided. Upland habitat use increased at night and in spring. Intensity of habitat use correlated with the amount of cover provided by shrubs over one metre tall.

Pils, C. M. and M. A. Martin. 1978. Population dynamics, predator-prey relationships and managment of the red fox in Wisconsin. Tech. Bull. No. 105, Dept. Nat. Res., Madison, Wisconsin. 56 pp.
Numbers, den ecology, reproduction, home range, dispersal, habitat use, mortality and predator-prey relationships of the red fox were studied in Wisconsin. Prey populations were assessed. Recommendations for management were made.

Pimlott, D. H., J. A. Shannon and G. B. Kolenosky. 1969. The ecology of the timber wolf in Algonquin Provincial Park. Ontario Dept. of Lands and Forests. Res. Br. Res. Rep. (Wildl.) No. 87. 92 pp.
The demography, food habits and movements of wolf packs were studied in Algonquin Park from 1958 to 1965. Wolf numbers were regulated through variable natality and juvenile mortality. Deer, moose and beaver were the main prey species. Wolf density was estimated at one per 26 square km. Distribution of packs was uniform.

Poelker, R. J. and H. D. Hartwell. 1973. Black bear of Washington. Washington State Game Dept. Biol. Bull. No. 14. 180 pp.
A study of black bears was carried out in Washington to study bear damage on conifers and bear populations and biology. Bear damage in conifer forests is described. Bear movements, reproduction, food habits, pathology, demography and management are discussed.

Polderboer, E. B., L. W. Kuhn and G. O. Hendrickson. 1941. Winter and spring habits of weasels in central Iowa. J. Wildl. Manage. 5:115-119.
Winter tracking was used to study the movements, denning, habits and predation habits of the long-tailed weasel. Five weasels were found in the 160-acre study area. Dens were in ground squirrel and pocket gopher burrows. The diet was dominated by Microtus.

Powell, R. A. 1972. A comparison of populations of boreal red-backed vole (Clethrionomys gapperi) in tornado blowdown and standing forest. Can. Field-Nat. 86:377-379.
Densities and reproductive conditions of red-backed voles were compared in standing forest and in a tornado blowdown. Voles were more numerous in the blowdown and those voles tended to be juveniles (sexually inactive).

Purdy, R. O., D. C. Parkyn and J. D. Folinsbee. 1983. Wildlife surveys of selected Edmonton area lakes, June-July 1982. Alberta Energy and Nat. Res., Fish and Wildl. Div. Unpubl. Rep. 139 pp.
Wildlife surveys on a number of Edmonton area lakes are reported. Surveys were designed to assess waterfowl use and to find rare or colonial bird species. Notes on mammals are also included. Results include survey data for Blackfoot Lake and Cooking Lake. Shoreline use and vegetation is described.

Quick, H. F. 1955. Food habits of marten (Martes americana) in northern British Columbia. Can. Field-Nat. 69:144-147.
The relationship between the food habits of marten and prey abundance was studied near Fort Nelson, B.C. Red-backed voles were an important food item but their use as food did not increase as abundance increased.

Quimby, D. C. 1951. The life history and ecology of the jumping mouse, Zapus hudsonius. Ecol. Monogr. 21:61-95.

An extensive study of the jumping mouse was carried out in Minnesota. Included in this paper are a description of development, notes on reproduction, various ecological notes, food habits, home range and population estimates.

Radvanyi, A. 1959. Inherent rhythms of activity of the northern flying squirrel in relation to illumination and to lunar and solar photoperiodism. Ph.D. thesis, Univ. of B.C., Vancouver, B.C. 191 pp.
Activity of the northern flying squirrel was studied in terms of illumination and time of day, lunar cycle and year. Animals were most active at night, between sunset and midnight and under lowest light intensity.

Radvanyi, A. 1970. Small mammals and regeneration of white spruce forests in western Alberta. Ecology 51:1102-1105.
Spruce seeds were radiotagged to permit the determination of the fate of the seeds after planting. Peromyscus, Microtus, Clethrionomys, Eutamias and Sorex fed on seed on the ground. Mice, the major consumers of seed, took about 50% of seed planted in spring as compared to about 19% of seed planted in winter.

Raine, R. M. 1982. Ranges of juvenile fisher, Martes pennanti, and marten, Martes americana, in southeastern Manitoba. Can. Field-Nat. 96:431-438.
Radiotelemetry was used to study ranges of juveniles of a resident population of fishers and of an invading population of marten. Two juvenile female fishers had winter ranges of 15.0 and 20.5 km^2. One juvenile male marten had an early winter range of 9.6 km^2 while another had a spring range of 8.1 km^2. A juvenile female marten had seasonal ranges varying from 6.0 to 8.4 km^2.

Raine, R. M. 1983. Winter habitat use and responses to snow cover of fisher (Martes pennanti) and marten (Martes americana) in southeastern Manitoba. Can. J. Zool. 61:25-34.
Winter tracking was used to test for restricted mobility and habitat use by fisher and marten in soft snow conditions. Both species were hindered by soft snow cover and fishers were more restricted than marten. Use of hare trails as well as their own trails increased in midwinter when snow cover was soft and deep.

Ream, C. H. 1981. The effects of fire and other disturbances on small mammals and their predators: an annotated bibliography. USDA Forest Service Gen. Tech. Report INT-106, 55 pp. Intermt. For. and Range Exp. Stn., Ogden, Utah 84401.
This annotated bibliography covers topics of fire, logging, grazing, pesticides and mining as disturbances of small mammal populations as well as topics of small mammal problems in reforestation.

Reid, V. H., R. M. Hansen and A. L. Ward. 1966. Counting mounds and earth plugs to census mountain pocket gophers. J. Wildl. Manage. 30:327-334.

Counts of mounds and earth plugs in fall was tested as a method of approximating populations of pocket gophers. This count of new sign in fall reflects the digging activity of maturing young as they disperse.

Rivard, D. H. 1982. Evaluation of track techniques for resource descriptions and monitoring wildlife populations in national parks. Nat. Res. Div., Parks Canada. Ottawa. 84 pp.
This text reviews the literature on wildlife tracking techniques. Studies conducted in Canada's national parks using tracking techniques are reviewed. Advantages of, constraints to and applications for tracking techniques in national parks are discussed.

Robinson, W. B. 1961. Population changes of carnivores in some coyote-control areas. J. Mammal. 42:510-515.
During predator control efforts, numbers of badgers, skunks, raccoons, swift foxes and other mammals were monitored in traps set for coyotes and bobcats. While coyote numbers were reduced, populations of bobcats, skunks, raccoons, badgers and swift foxes tended to increase.

Rogers, L. 1976. Effects of mast and berry crop failures on survival, growth, and reproductive success of black bears. Trans. N. Am. Wildl. Conf. 41:431-438.
Food availability was studied as a factor limiting populations of black bears. Well-fed, captive bears grew faster and matured at an earlier age than wild bears. Females which had not gained sufficient weight before entering hibernation tended not to produce cubs.

Rongstad, O. J. 1965. A life history study of thirteen-lined ground squirrels in southern Wisconsin. J. Mammal. 46:76-87.
Natural history and demography of thirteen-lined ground squirrels were studied in Madison, Wisconsin. Timing of breeding, birth of litters, dispersal and hibernation were noted. Burrows were described. Density, home range size, litter size and survival rates were calculated.

Roughton, R. D. and M. W. Sweeny. 1982. Refinements in scent-station methodology for assessing trends in carnivore populations. J. Wildl. Manage. 46:217-229.
Refinements of the scent-station index method of determining trends in carnivore populations are proposed. Recommendations affect the attractant used, the placement and operation of the scent station and the analysis of the data. A computer program for data analysis is presented.

Rowe, J. S. and G. W. Scotter. 1973. Fire in the boreal forest. Quaternary Res. 3:444-464.

Fire is described as a natural part of the ecology of the boreal forest. Evidence for past fires in soil and vegetation, and effects of fire on vegetation composition, soil properties and wildlife populations are discussed.

Rusch, D. A. and W. G. Reeder. 1978. Population ecology of Alberta red squirrels. Ecology 59:400-420.
Habitat use, litter sizes, sex ratios, dispersal, survival, food requirements and population regulation of red squirrels were studied near Rochester, Alberta. Spruce stands were preferred over pine stands which were preferred over aspen stands. After fall dispersal, most residents of spruce and pine stands were adults while those of aspen stands were all juveniles. Survival was lowest in the aspen habitat.

Rusch, D. A., W. G. Reeder and D. H. Rusch. 1982. Eye lens, testes and body weight trends in Alberta red squirrels. J. Wildl. Manage. 46:1010-1017.
Eye lens weight, testes weight and body weight of red squirrels were studied near Rochester, Alberta. Three methods of age designation for red squirrels was described. Body weights of squirrels in aspen forest were less than those of squirrels in spruce or jack pine forest.

Salt, J. R. 1976. Seasonal food and prey relationships of badgers in east-central Alberta. Blue Jay 34:119-122.
Food habits of badgers near Wainwright, Alberta were studied by analysis of scats and stomach contents. Pocket gophers made up the majority of the diet in spring. In July, Richardson's ground squirrels became a significant diet item. Insects, mainly grasshoppers and beetles, made up the fall diet.

Samoil, H. P., L. N. Carbyn and D. Sept. 1977. Prescribed burn study of fescue grasslands in Prince Albert National Park. Progress Rep. No. 2. Prep. by Can. Wildl. Serv. for Parks Canada. 73 pp.
The distribution of ungulates, small mammals and birds was studied in grassland, ecotone and forest habitats in Prince Albert National Park. Abundance was compared in burned and unburned habitats.

Sanderson, G. C. 1950. Methods of measuring productivity in raccoons. J. Wildl. Manage. 14:389-402.
Practical methods of devising indices of abundance and productivity were sought for the management of raccoon populations. Techniques for determining age and sex of raccoons and for measuring litter sizes are described.

Sargeant, A. B. 1966. A live trap for pocket gophers. J. Mammal. 47:729-731.
Construction of a live trap for pocket gophers and results of test sets of the traps are described.

Sargeant, A. B., W. K. Pfeifer and S. H. Allen. 1975. A spring aerial census of red foxes in North Dakota. J. Wildl. Manage. 39:30-39.

An aerial census method for red foxes is described. Adults, pups and rearing dens were mapped from the air in mid-May searches and the density of fox families was determined.

Sargeant, A. B. and D. W. Warner. 1972. Movements and denning habits of a badger. J. Mammal. 53:207-210.
Dens, food and movements in summer, fall and winter were described for the badger in Minnesota. In summer, the badger occupied 1880 acres and numerous dens. In autumn, it occupied 130 acres and dens were often reused. One den was used in winter and travel encompassed only 5 acres.

Saunders, J. K., Jr. 1963a. Food habits of the lynx in Newfoundland. J. Wildl. Manage. 27:384-390.
Contents of digestive tracts and scats were analyzed to describe the food habits of Newfoundland lynx. Snowshoe hares were the main diet item while birds, mice and carrion made smaller contributions to the diet.

Saunders, J. K., Jr. 1963b. Movements and activities of the lynx in Newfoundland. J. Wildl. Manage. 27:390-400.
Movements, home range and behaviour of lynx in Newfoundland were studied by winter tracking and by mark and recapture methods.

Schowalter, D. B. 1978. Some western Canadian bat records. Blue Jay 36:49-50.
Observations of the long-eared, long-legged, small-footed and hoary bats in Alberta are reported. The hoary bat was reported throughout the province while the other bats were found only in southern Alberta.

Schowalter, D. B. 1979. Notes on distribution of bats in Alberta and Saskatchewan. Blue Jay 37:179-187.
The ranges of nine species of bats are described and mapped in Alberta and Saskatchewan.

Schowalter, D. B. 1980a. Characteristics of bat rabies in Alberta. Can. J. Comp. Med. 44:70-76.
Infection rates are examined in bats submitted by the public for rabies testing. Rabies in little brown and big brown bat colonies occurs as short-term, localized outbreaks. Migratory bats maintain rabies in northern bat populations.

Schowalter, D. B. 1980b. Swarming, reproduction and early hibernation of Myotis lucifugus and M. volans in Alberta, Canada. J. Mammal. 61:350-354.
Little brown bats and long-legged bats were trapped at Cadomin Cave in Alberta during August and September. Swarming behaviour, reproductive condition, body weight and hibernation are described.

Schowalter, D. B. and J. R. Gunson. 1979. Reproductive biology of the big brown bat (Eptesicus fuscus) in Alberta. Can. Field-Nat. 93:48-54.

Data collected on the big brown bat during rabies studies in Alberta are reported. Distribution, maternity colonies, reproduction, migration, survival and age structure are described.

Schowalter, D. B. and J. R. Gunson. 1982. Parameters of population and seasonal activity of striped skunks, Mephitus mephitus, in Alberta and Saskatchewan. Can. Field-Nat. 96:409-420.
Parkland versus prairie and northern versus southern skunk populations are compared. Parkland and prairie skunks were generally similar. Northern skunks were distinguished from southern skunks by their extensive use of buildings for denning, their extensive fall dispersal of juveniles and two annual peaks in incidence of rabies.

Schowalter, D. B., J. R. Gunson and L. D. Harder. 1979. Life history characteristics of little brown bats (Myotis lucifugus) in Alberta. Can. Field-Nat. 93:243-251.
Aspects of the life history of the little brown bat are described from data collected during a rabies study. Locations of maternity colonies and hibernacula, use of shelters, migration, body weight changes and reproduction are discussed.

Schowalter, D. B., L. D. Harder, and B. H. Treichel. 1978. Age composition of some vespertilionid bats as determined by dental annuli. Can. J. Zool. 56:355-358.
Method of age determination in bats using dental annuli was described. This ageing technique was considered effective for big brown, silver-haired, red and hoary bats. Age structure was described for a population of big brown and little brown bats.

Schowalter, D. B., W. J. Dorward and J. R. Gunson. 1978. Seasonal occurrence of silver-haired bats (Lasionycteris noctivagans) in Alberta and British Columbia. Can. Field-Nat. 92:288-291.
Specimen records of the silver-haired bat in Alberta and British Columbia were examined. Numbers of bats collected in Alberta peaked in June and August-September and consisted essentially of only females or only males and young. This bat appears to migrate across southern Alberta in spring and fall.

Schwanke, R. and K. Baker. 1977. The beaver of Elk Island National Park. Res. Cons., Parks Canada, Western Region. 125 pp.
The abundance, distribution and population trends of beaver were studied by means of aerial and ground surveys as well as review of earlier studies. Growth rates, reproductive parameters, food plant utilization, habitat utilization and management problems are discussed.

Scott, T. G. 1943. Some food coactions of the northern plains red fox. Ecol. Monogr. 13:427-479.
Home range, movements and feeding habits of the red fox were studied. Foxes were primarily carnivorous but ate insect and plant material when available. Microtus, Peromyscus and cottontail rabbits were staple foods.

Scott, T. G. and W. D. Klimstra. 1955. Red foxes and a declining prey population. Southern Illinois University Monogr. Ser. No. 1. Carbondale, Illinois. 123 pp.
Food habits of red foxes were studied in Iowa when prey abundance was low. Food preferences were apparent but prey selection related largely to relative availability. Fox predation neither prevented the recovery of prey species from low numbers nor controlled high prey numbers. In season, fruit was the preferred food item.

Scotter, G. W. 1964. Effects of forest fires on the winter range of barren-ground caribou in northern Saskatchewan. Can. Wildl. Serv. Manage. Bull. Series 1, No. 18. 109 pp.
The effects of forest fires were studied as a factor in declining caribou populations. Changes in soil conditions, terrestial forage, arboreal lichens, and in use of burned areas by caribou and other wildlife species were recorded. Loss of arboreal lichens reduced winter forage for caribou.

Searing, G. F. 1979. Distribution, abundance and habitat associations of beavers, muskrats, mink and river otters in the AOSERP study area, northeastern Alberta. Prep. for Alberta Oil Sands Environmental Research Program by LGL Ltd. AOESERP Report 73. 119 pp.
Habitat preferences of four semi-aquatic mammals were studied by aerial surveys and track counts. Beavers preferred deciduous, white spruce and willow fen habitats and mink preferred willow and aspen habitats. Muskrat and otter preferences were not determined due to the lack of data.

Shantz, B. R. 1966. Rodent-watershed relationships. Progress Report. Unpubl. Can. Wildl. Serv. Rep. CWS-9-66. 23 pp.
Density of pocket gopher mounds are reported for four study plots. Observations of Columbian, Richardson's and thirteen-lined ground squirrels are summarized.

Shantz, B. R. 1967. Rodent-watershed relationships. Progress Report. Unpubl. Can. Wildl. Serv. Rep. CWS-29-67. 79 pp.
The influence of various environmental factors on the digging activity of pocket gophers was studied in the grasslands of southeastern Alberta. Pocket gopher activity appeared to be related to poor range management. Pocket gophers are suggested as indicators of poor range. An analysis of potential relationships between pocket gopher activity and various environmental parameters was not completed.

Sharp, W. M. and L. H. Sharp. 1956. Nocturnal movements and behavior of wild raccoons at a winter feeding station. J. Mammal. 37:170-177.
Activity levels during the night, social structure, effects of wind and temperature on nocturnal activity and periods of winter inactivity were studied in raccoons visiting a feeding station in Nebraska. Most raccoons fed before midnight. Activity was reduced by low temperatures and high winds. Young raccoons remained active longer than adults in poor weather conditions. Raccoons were inactive at temperatures below -5°C.

Sheldon, W. G. 1950. Denning habits and home range of red foxes in New York State. J. Wildl. Manage. 14:33-42.
Denning, home range and seasonal population shifts of the red fox were studied in central New York.

Sheppard, D. H. 1972. Reproduction of Richardson's ground squirrel (Spermophilus richardsonii) in southern Saskatchewan. Can. J. Zool. 50:1577-1581.
Life history data, including litter size, breeding season, sex ratio and body size, were described in a study of Richardson's ground squirrels carried out near Regina, Saskatchewan. Average litter size was 6.93 viable embryos. Females bred as yearlings.

Sikes, S. K. 1968. Eastern slopes (Alberta) watershed program - wildlife. II. Pocket gopher and watersheds. Unpubl. Can. Wildl. Serv. Rep. CWS-132-68. 8 pp.
Activities of a pocket gopher study are outlined for the field season of summer 1968.

Simmons, J. A., M. B. Fenton, W. R. Ferguson, M. Jutting and J. Palin. 1979. Apparatus for research on animal ultrasonic signals. Royal Ontario Museum, Life Sciences Miscellaneous Publications. Toronto. 31 pp.
Apparatus used for the detection of ultrasonic sound is described in terms of its construction, components, type of information provided by the equipment and availability of parts and assembled equipment.

Sims, H. P. and C. H. Buckner. 1973. The effect of clear cutting and burning of Pinus banksiana forests on the populations of small mammals in southeastern Manitoba. Am. Midl. Nat. 90:228-231.
Small mammal populations were monitored in control, clear-cut and burn sites over a three-year period. Increased deer mouse numbers and decreased meadow vole, red-backed vole and masked shrew numbers were found in clear-cut and burned sites.

Slough, B. G. and R. M. F. S. Sadleir. 1977. A land capability classification system for beaver (Castor canadensis Kuhl). Can. J. Zool. 55:1324-1335.
Beaver colony density was compared with various habitat factors of lakes and streams. Significant habitat factors were identified and a land capability classification system was developed. Beaver management is discussed.

Smith, G. H. 1977. Population characteristics of the porcupine in northeastern Oregon. J. Mammal. 58:674-676.
Porcupines were studied in conifer forests of Oregon. Age distribution, sex ratios, reproduction, home range, density and the effects of food availability and predation on density are discussed.

Smith, H. C. 1979a. Movement of banded bats in Alberta. Blue Jay 37:117-118.

A banding program for bats in Alberta attempted to determine the locations of hibernacula and summer areas for captured bats. Three bands were recovered. The movements of one big brown bat and two little brown bats are described.

Smith, H. C. 1979b. Long-legged bat in Alberta. Blue Jay 37:230-235. Measurements of specimens of long-legged bats collected in Alberta were analysed. The significance of sex and collection location in the measurements was examined. Range is described in Alberta.

Smith, H. C. 1979c. Mammals of the Edmonton area. Nat. Hist. Occ. Paper No. 2. Prov. Mus. of Alberta, Edmonton.
An annotated list of mammals is presented for a study area including Stony Plain, Elk Island National Park, Camrose and Leduc. Museum specimens were examined and records and literature were reviewed for this publication.

Smith, H. C. 1981. The distribution of mammals in southeastern Alberta as indicated by the analysis of owl pellets. Blue Jay 39:230-238. Numbers of individual small mammals and birds identified in the pellets of great horned owls and burrowing owls are listed. These lists contribute to the determination of distributions of small mammals in southeastern Alberta.

Smith, H. C. 1982a. Alberta mammals. Alta. Nat. 12:80-81.
The current status of Alberta mammal populations is described. The author points out that several species are either at the limits of their geographic range or poorly known and that the comments on a species status must be taken in this context.

Smith, H. C. 1982b. A key to Alberta bats. Alberta Nat. 12:115-121.
A dichotomous key to nine species of bats found in Alberta is presented. Species are described in terms of distribution and abundance in Alberta, appearance, distinguishing features and subspecies.

Smith, H. C. 1983. The little brown bat. Alta. Nat. 13:91-95.
The natural history of the little brown bat in Alberta is described. A description of the animal, its Alberta distribution, reproduction, hibernation, echo-location and foods are presented.

Smith, H. C. and R. D. Burns. 1976. Range extensions for four small mammals in Alberta. Blue Jay 34:179-181.
Known ranges for Sorex arcticus, S. vagrans, S. palustris and Clethrionomys gapperi were extended following mammal surveys conducted in eastern and central Alberta. Ranges were extended southward.

Smith, M. C. 1968. Red squirrel responses to spruce cone failure in interior Alaska. J. Wildl. Manage. 32:305-317.

Diet of red squirrels was studied during two consecutive years of white spruce cone failure. In the first year, squirrels survived well by feeding on cones stored in the previous year. There was mortality in the second year. Survivors fed on spruce buds.

Snead, E. and G. O. Hendrickson. 1942. Food habits of the badger in Iowa. J. Mammal. 23:380-391.
Spring, summer and fall food habits of the badger were studied by scat analysis in Iowa. Ground squirrels, mice, cottontail rabbits and insects were the main food items.

Sonenshine, D. E., D. G. Cerretani, G. Enlow and B. L. Elisberg. 1973. Improved methods for capturing wild flying squirrels. J. Wildl. Manage. 37:588-590.
A "portable squirrel catcher" and an "arboreal shelter trap" are described. The squirrel catcher permits the trapper, while still on the ground, to take squirrels from tree cavities. The shelter trap serves as a live trap and as an artificial shelter where squirrels can be observed.

Soper, J. D. 1940. Preliminary faunal report on Elk Island National Park, Alberta, Canada. Nat. Parks Bureau, Lands, Parks and Forest Branch, Dept. of Mines and Res. Winnipeg. 48 pp.
The annotated list of mammals and birds summarizes the observations of the author during his July 24 to 30, 1940 visit to the park as well as recorded observations of others. Park vegetation, lakes and geology are described.

Soper, J. D. 1950. Birds and mammals of Elk Island National Park. Unpubl. Report. Can. Wildl. Serv. Edmonton, Alberta. 124 pp.
This is an annotated list of birds and mammals of Elk Island National Park. A limited amount of data was available for this report and therefore the list of species and the assessment of their distribution and abundance was of a preliminary nature.

Soper, J. D. 1951. The mammals of Elk Island National Park, Alberta, Canada. Can. Wildl. Serv., Wildl. Manage. Bull., Ser. 1, No. 3. 27 pp.
Twenty-seven species of mammals known to occur in Elk Island National Park were described in terms of occurrence, relative abundance and distribution within the park. Four additional species were noted as probable residents.

Soper, J. D. 1964. The mammals of Alberta. The Hamly Press Ltd. Edmonton. 410 pp.
The species and subspecies of Alberta mammals are described in terms of appearance, identification, distribution in the province, habitat and reproduction.

Sorenson, M. W. 1963. Some aspects of water shrew behavior. Am. Midl. Nat. 68:445-462.

Water shrew behaviour, food habits and metabolism were studied in a laboratory enclosure. Nesting behaviour, tunneling behaviour, behaviour in interspecific and intraspecific encounters and sensory abilities were also examined.

Speer, R. J. and T. G. Dilworth. 1978. Porcupine winter food and habitat utilization in central New Brunswick. Can. Field-Nat. 92271-274.
The winter foods and habitats of the porcupine were studied in central New Brunswick. Areas utilized by porcupines in winter were wetter, closer to a water supply, had smaller diameter trees and had greater amounts of conifer cover than the study area as a whole.

Sperry, C. C. 1941. Food habits of the coyote. U.S. Dept. Interior, Fish and Wildl. Serv., Wildl. Res. Bull. 4. 70 pp.
Food habits of coyotes of western United States were studied by analysis of stomach contents. Main items of the diet were rabbits, carrion, rodents, livestock (sheep and goats), deer, birds, insects and vegetable matter. Carrion, which was most important in winter, was mainly of farm origin.

Stebbins, L. L. 1976. Overwintering of the red-backed vole at Edmonton, Alberta, Canada. J. Mammal. 57:554-561.
Growth of the red-backed vole during winter and the progression of the breeding season in spring were studied at Edmonton.

Stelfox, J. G. 1969. Wolves in Alberta - a history 1800-1969. Alberta Lands Forests, Winter, 1969:18-27.
Fluctuations in wolf numbers were traced from 1800 to 1969. Observations in this paper included one of a wolf seen in the northern part of Elk Island National Park in March 1967.

Stewart, R. W. and J. R. Bider. 1977. Summer activity of muskrats in relation to weather. J. Wildl. Manage. 41:487-499.
Sandtracking and mark recapture techniques were used to study the effects of weather on daily activity, spatial distribution and movements of ditch-dwelling muskrats in Québec. Variations in daily activity, increased daylight activity, increased use of peripheral areas of territories and increased colonization movements were related to rainfall.

Strong, W. L. and K. R. Leggat. 1981. Ecoregions of Alberta. Resource Evaluation and Planning Division, Alberta Energy and Natural Resources, Edmonton. 64 pp.
Twelve ecoregions were mapped and described in Alberta. Descriptions include climate, soils, dominant vegetation and land use patterns. Elk Island National Park falls in the boreal mixedwood ecoregion but is surrounded by lands in the aspen parkland ecoregion.

Stuewer, F. W. 1948. Artificial dens for raccoons. J. Wildl. Manage. 12:296-301.

An artificial denning box for raccoons is described. Location and use of artificial boxes is discussed. Where the maintenance of a raccoon population is desired, use of artificial denning boxes is advocated because raccoons usually prefer tree dens over ground dens, raccoons cannot build their own den structure and natural tree cavities are declining due to tree harvesting.

Sunquist, M. E. 1974. Winter activity of striped skunks (Mephitus mephitus) in east-central Minnesota. Am. Midl. Nat. 92:434-446.
Movements, daily activity, duration of winter den use, weight loss and mortality of striped skunks were studied during winter near Minneapolis, Minnesota. Winter den use began in late November. Movements were usually near the den. Increasing snow depth restri ted movements.

Swenson, J. E., S. J. Knapp, P. R. Martin and T. C. Hinz. 1983.
Reliability of aerial cache surveys to monitor beaver population trends on prairie rivers in Montana. J. Wildl. Manage. 47:697-703.
Location of caches was accurate and constant among years and search areas. Colony size, however, did vary among years and areas. Data on age, sex and numbers per colony are needed to assess trends in beaver populations.

Taylor, M. E. and N. Abrey. 1982. Marten, Martes americana, movements and habitat use in Algonquin Provincial Park, Ontario. Can. Field-Nat. 96:439-447.
Radiotelemetry was used to study habitat use and movements of male marten. Marten preferred conifer and conifer-dominated mixed forests. Foraging areas of individuals did not overlap and territories were maintained by mutual avoidance. Territorial boundaries changed over time.

Telfer, E. S. 1972a. Report on the establishment of range trend transects at Elk Island National Park. Unpubl. Can. Wildl. Serv. Rep. 32 pp. and appendix.
Methods and results of measurements of production, composition and utilization of browse and herbs in Elk Island National Park are described. Browse production was sufficient to support existing ungulate populations if elk did not switch to browse as snow depths increased. Monitoring of browse and herbage transects was recommended to guide ungulate population management.

Telfer, E. S. 1972b. Browse selection by deer and hares. J. Wildl. Manage. 36:1344-1349.
Available browse and browse utilized by white-tailed deer and snowshoe hares were assessed by weight in forests in New Brunswick and Nova Scotia. Deer and hares used conifers in winter. Browsing intensity was greater by hares than deer and hares were less selective of browse species.

Telfer, E. S. 1974. Vertical distribution of cervid and snowshoe hare browsing. J. Wildl. Manage. 38:944-946.

Examples of the effect of snow on height of browsing are given. With browsers travelling on top of snow, with snow weighting branches down and with moose straddling small trees, the upper limit of browsing cannot be accurately defined.

Teranishi, R., E. L. Murphy, D. J. Stern, D. S. Balser, W. E. Howard and D. B. Fagre. 1981a. Bait posts. Worldwide Furbearer Conference Proc. 3:1852-1861.
Uses and methodology for bait posts in coyote control programs or studies are described. Advantages of bait posts are economy, little environmental contamination, controlable impact on non-target species and use for applying toxicants, anti-fertility drugs or tranquilizers.

Teranishi, R., E. L. Murphy, D. J. Stern, W. E. Howard and D. F. Fagre. 1981b. Chemicals useful as attractants and repellents for coyotes. Worldwide Furbearer Conference Proc. 3:1839-1851.
Commercially-available chemicals and compounds found in coyote urine were tested on coyotes as repellents and attractants. The isolation, identification and use of these substances are discussed.

Tester, J. R. 1965. Effects of a controlled burn on small mammals in a Minnesota oak-savanna. Am. Midl. Nat. 74:240-243.
Marked small mammals were trapped before and after a fire. Deer mouse numbers increased to exceed pre-burn numbers in 35 days, but most animals found after the burn were immigrants rather than marked residents. Red-backed vole numbers remained unchanged after the fire but immigrants were again common.

Tevis, L., Jr. 1956. Effect of a slash burn on forest mice. J. Wildl. Manage. 20:405-409.
Live-trapping of mice was carried out on a clear-cut prior to slash burning. The area was snap trapped after the burn. Animals surviving the fire appeared to be residents of the forest edge rather than the clear-cut, or were found in unburned islands. The burn area was then invaded by deer mice in numbers exceeding pre-burn levels.

Tietje, W. D. and R. L. Ruff. 1980. Denning behavior of black bears in boreal forest of Alberta. J. Wildl. Mange. 44:858-870.
Timing of denning, den construction, den location, and survival of black bears was studied near Cold Lake, Alberta. Mature spruce stands and aspen-spruce stands were favoured denning habitats. Bears entered their dens during October and emerged in early April. Bears denning at locations disturbed by man lost more weight during the winter than undisturbed bears but survival was not affected.

Tietjen, H. P., C. H. Halvorson, P. L. Hegdal and A. M. Johnson. 1967. 2,4-D herbicide, vegetation and pocket gopher relationships - Black Mesa, Colorado. Ecology 48:634-643.

The impact of herbicide application on vegetation and on pocket gophers was studied in Colorado. Pocket gopher numbers declined following herbicide application. The decline was due to the loss of forbs and food rather than to direct toxic effects of the herbicide.

Todd, A. W. 1978. Coyotes. Alberta Fish and Wildlife Div. Unpubl. Rep. 7 pp.
Management of the coyote in Alberta is described. Coyotes are predators of cattle, sheep, hogs and poultry. Coyote natural history, regulations concerning coyotes, trapping and poisoning programs and the handling of complaints from farmers is outlined.

Todd, A. W., J. R. Gunson and W. M. Samuel. 1980. Sarcoptic manage: an important disease of coyotes and wolves of Alberta, Canada. Worldwide Furbearer Conference Proc. 3:706-729.
The incidence of sarcoptic manage in coyotes, wolves and red foxes in Alberta was assessed by serial surveys, examination of carcasses and by questionnaire. Food habits and body condition of infected animals were assessed. Effects on populations were discussed.

Todd, A. W. and L. B. Keith. 1973. Coyote population dynamics and ecology in Alberta. Unpublished progress report, Department of Wildlife Ecology, Univ. of Wisconsin, Madison. 14 pp.
Results of the coyote portion of a study on cyclic populations of herbivores and carnivores were summarized. Snowshoe hares and rodents were important winter food items in forest habitats while agricultural carrion was important in farmed areas.

Todd, A. W. and L. B. Keith. 1976. Responses of coyotes to winter reductions in agricultural carrion. Alberta Fish and Wildlife Div., Wildl. Tech. Bull. No. 5. 32 pp.
The effects of the elimination of agricultural carrion on coyote populations was studied near Westlock, Alberta. Carrion reduction resulted in increased use of meadow voles and snowshoe hares, decreased coyote numbers and no increase in livestock predation. Coyotes appeared to spend the summer in forested habitats and to move to farming areas for the winter.

Todd, A. W. and L. B. Keith. 1983. Coyote demography during a snowshoe hare decline in Alberta. J. Wildl. Manage. 47:394-404.
Demographic changes in coyotes were monitored during a decline in snowshoe hare numbers (1970-1975) in Alberta forests. Total food intake and the proportion of hares in the coyote diet declined as the hare population declined. Coyote pregnancy rates, litter sizes and the proportion of juveniles in the population declined.

Todd, A. W., L. B. Keith and C. A. Fischer. 1981. Population ecology of coyotes during a fluctuation of snowshoe hares. J. Wildl. Manage. 45:629-640.

Data on coyote ecology and demography collected near Rochester and Westlock, Alberta from 1964 to 1975 are presented. Cyclic coyote densities were directly related to hare densities. Proportions of hares in the coyote diet also varied with hare densities. Use of open habitats, feeding on larger mammals, litter size and breeding by yearling female coyotes were affected by changing hare densities.

Trottier, G. C. 1974. Beaver studies - Riding Mountain National Park 1973. Can. Wildl. Serv. Rep. prep. for Parks Canada. Edmonton, Alberta. 84 pp.
Distribution, abundance and winter food preferences of beaver in Riding Mountain National Park were studied in 1973. Impacts of beaver activity on both the natural and man-made components of the Park environment were assessed. Recommendations for management of beaver are presented.

Trump, R. F. and G. O. Hendrickson. 1943. Methods for trapping and tagging woodchucks. J. Wildl. Manage. 7:420-421.
Construction of a live trap for woodchucks is described. Placement of traps and handling and tagging of captured animals is also described.

Tufts, P. D. 1967. A comparative study of some environmental factors affecting beaver colony site locations. M.Sc. thesis, Acadia Univ., Wolfville, N.S. 174 pp.
Beaver colonies were studied in Nova Scotia to determine environmental factors affecting the quality of colony sites. Water depth, stream flow rates, clay soils for dam construction, sheltered shorelines for shore ledges, food supply, access to food supply and absence of occupants were considered important factors.

Turner, B. N., M. R. Perrin and S. L. Iverson. 1975. Winter co-existence of voles in spruce forest: relevance of seasonal changes in aggression. Can. J. Zool. 53:1004-1011.
Meadow voles moved in November onto a spruce forest study area inhabited by red-backed voles and remained there until April when they disappeared from the study area. These two species may share habitats when interspecific aggression is low outside of the breeding season.

Van Camp, J. 1975. Snow conditions and the winter feeding behavior of Bison bison in Elk Island National Park. Can. Wildl. Serv. Rep. prep. for Parks Canada. 91 pp.
Feeding behaviour of bison was studied in Elk Island National Park during the winter of 1973-74, a winter of heavy snowfall. Bison fed principally in wet sedge meadows and wet shrubland in winter. These habitats offered snow conditions which were less severe and a forage morphology which was more obtainable through snow cover than elsewhere.

Van Camp, J. and E. S. Telfer. 1975a. Browse yield and use by ungulates in Elk Island National Park, 1973-74. Can. Wildl. Serv. Rep. prep. for Parks Canada. 43 pp.
Browse production and utilization by ungulates was measured in 1974 on transects established in 1972 in Elk Island National Park. Browse utilization was heavy but production exceeded the demand by ungulates. Maintaining existing population levels of ungulates was recommended. Conversion of aspen forest to shrubland was proposed to increase browse production.

Van Camp, J. and E. S. Telfer. 1975b. Hare habitat and cover relationships in Elk Island National Park. Can. Wildl. Serv. Rep. prep. for Parks Canada. 35 pp.
Hare habitat in Elk Island National Park was studied to explain low numbers of hares throughout their population cycle. A lack of cover as measured by conifer cover, shrub density and shrub height was found. This lack of cover for hares was associated with heavy browsing by park ungulates.

Van Wormer, J. 1964. The world of the coyote. J. B. Lippincott Company, Philadephia and New York. 150 pp.
This description of the coyote is written for a popular-literature audience and the text includes numerous photographs. Natural history of the coyote is described by season of the year. Coyote-human interactions are described and include the coyote as a pet as well as an agricultural problem.

van Zyll de Jong, C. G. 1963. The biology of the lynx, Felis (Lynx) canadensis (Kerr) in Alberta and the MacKenzie District, N.W.T. M.Sc. thesis, Univ. of Alberta, Edmonton. 76 pp.
Information on the biology of the lynx was obtained from carcasses collected during a high lynx population. Movements of yearlings and males into unfavourable habitats (farmland, urban areas, prairie) were indicated. Standard measurements, growth, ossification of bones, an ageing method, dentition and molt are described. Hares and microtines were the dominant foods.

van Zyll de Jong, C. G. 1966a. Food habits of the lynx in Alberta and the MacKenzie District, N.W.T. Can. Field-Nat. 80:18-23.
Contents of digestive tracts of lynx from Alberta and adjacent Northwest Territories areas were examined. Snowshoe hare, microtines, red squirrels, ground squirrels, beaver, deer, grouse and ducks were found in the diet. Results were compared to those of a Newfoundland study (Saunders 1963).

van Zyll de Jong, C. G. 1966b. Parasites of the Canada lynx, Felis (Lynx) canadensis (Kerr). Can. J. Zool. 44:499-509.
Carcasses of 113 lynx from Alberta and adjacent Northwest Territories were examined for parasites. Ectoparasites were not found on the 18 carcasses examined for ectoparasites. Only three out of 113 lynx carcasses did not carry endoparasites. Geographical and anatomical distribution of the parasites is discussed.

van Zyll de Jong, C. G. 1979. Distribution and systematic relationships of long-eared Myotis in western Canada. Can. J. Zool. 57:987-994.
Characters of Myotis evotis, M. keenii keenii and M. k. septentrionalis were examined to clarify their taxonomy. Their distribution in western Canada is described. Evidence suggested that the subspecies of M. keenii should be considered as separate species.

van Zyll de Jong, C. G. 1980. Systematic relationships of woodland and prairie forms of the common shrew, Sorex cinereus cinereus Kerr and S. c. haydeni Baird, in the Canadian prairie provinces. J. Mammal. 61:66-75.
Morphology of woodland forms and prairie forms of the common shrew were compared in specimens from Alberta, Saskatchewan and Manitoba. These subspecies were found to have distinct forms even in the area of sympatry.

van Zyll de Jong, C. G. 1983. Handbook of Canadian mammals. 1. Marsupials and Insectivores. Nat. Mus. Nat. Sci., Ottawa. 210 pp.
One opossum, 16 shrew species and six mole species occurring in Canada are described. Descriptions include distribution, subspecies, habitat, food, parasites, reproduction, behaviour and a physical description.

Verts, B. J. 1967. The biology of the striped skunk. University of Illinois Press, Urbana. 218 pp.
The ecology and natural history of the striped skunk was studied in Illinois as part of a larger study of rabies in wildlife. The skunk was described in terms of its appearance, measurements, growth, behaviour, movements, denning, food habits, habitat, population size, reproduction and pathology.

Voigt, D. R. and B. D. Earle. 1983. Avoidance of coyotes by red fox families. J. Wildl. Manage. 47:852-857.
Movements of foxes and coyotes were studied by radiotelemetry. Foxes appeared to avoid raising pups in areas where coyotes raise pups or frequently travel.

Wagner, F. H. 1972. Coyotes and sheep: some thoughts on ecology, economics and ethics. 44th Faculty Honor Lecture, Utah State University, Logan, Utah. 59 pp.
Aspects of the ecology and management of coyotes are discussed. Population trends and management activities are described for a 30-year period. Effectiveness of controls in reducing coyote numbers is evaluated. Sheep losses to coyotes and attempts to reduce sheep losses are described. Economics of control efforts and the ethics of controlling populations are discussed.

Warnock, J. E. 1965. The effects of crowding on the survival of meadow voles (Microtus pennsylvanicus) deprived of cover and water. Ecology 46:649-664.

The effect of crowding on survival time of meadow voles was tested under laboratory conditions and under conditions of water deprivation and cover deprivation. Survival, particularly of males, was reduced by crowding under conditions of water or cover deprivation.

Weatherill, R. G. and L. B. Keith. 1969. The effect of livestock grazing on an aspen forest community. Alberta Dept. of Lands and Forests, Fish and Wildl. Div., Tech. Bull. No. 1. 31 pp.
The effect of various intensities of livestock grazing on vegetation and wildlife in aspen forest was studied near Rochester, Alberta. Densities of trees, ovenbirds, red-eyed vireos and least flycatchers were not affected. Increased grazing caused changes in herb species and declines in ruffed grouse broods, white-throated sparrows, deer mice, red-backed voles, snowshoe hares and shrub cover.

Weckwerth, R. P. and V. D. Hawley. 1962. Marten food habits and population fluctuations in Montana. J. Wildl. Manage. 26:55-74.
The relationship between numbers of marten, marten food habits and food abundance were studied in Montana. Food items consumed depended upon preference, availability and availability of alternate foods. Microtus and Clethrionomys were major food items. Marten numbers followed small mammal abundance.

Wetmore, S. P., C. H. Nellis and L. B. Keith. 1970. A study of winter coyote hunting with the use of snowmobiles. Alberta Dept. of Lands and Forests, Fish and Wildl. Div., Wildl. Tech. Bull. No. 2. 42 pp.
Coyote hunting was studied in agricultural areas north of Edmonton. Hunters using snowmobiles had the highest kill for hunting effort in comparison with other hunting methods. More juveniles and more females than expected were killed by hunters. Hunting mortality was added to natural mortality rather than replacing it.

Whitaker, J. O., Jr. 1963. A study of the meadow jumping mouse, Zapus hudsonius (Zimmerman), in central New York. Ecol. Monogr. 33:215-254.
An extensive study of the meadow jumping mouse was carried out in New York. Habitat factors were evaluated. Predators, food habits, hibernation, reproduction and mortality were discussed.

Williams, D. F. and S. E. Braun. 1983. Comparison of pitfall and conventional traps for sampling small mammal populations. J. Wildl. Manage. 47:841-845.
Numbers of small mammals caught by pitfall, snap and live traps were compared. More species and more animals (total catch) were taken in pitfall traps than either snap traps or live traps.

Williams, O. 1959. Food habits of the deer mouse. J. Mammal. 40:415-419.

Stomach contents of deer mice taken from seven locations in Wyoming and Colorado were analysed. Seeds were the most important item in the diet. Also found in the stomachs were insects, spiders, fruits, fungi, annelids and green vegetation.

Wilson, K. A. 1953. Raccoon predation on muskrats near Currituck, North Carolina. J. Wildl. Manage. 17:113-119.
Raccoons appeared to be preying upon young muskrats. Muskrat numbers were low in areas where raccoons were abundant. Muskrats occurred in expected numbers in areas where raccoons were rare and where muskrats lived in burrows instead of houses. No damage was done to muskrat houses in December when muskrats were not being born.

Wirtz, W. O. II. and P. G. Pearson. 1960. A preliminary analysis of habitat orientation in Microtus and Peromyscus. Am. Midl. Nat. 63:131-142.
Behaviour and habitat preference of the meadow vole and white-footed mouse were studied in old fields in New Jersey. Peromyscus was randomly oriented to habitat type. Microtus was more aggressive than the white-footed mouse.

Wobeser, G. A. and F. A. Leighton. 1979. A simple burrow entrance live trap for ground squirrels. J. Wildl. Manage. 43:571-572.
Construction and advantages of a live trap for ground squirrels are described. Advantages include simple construction, inexpensive materials, multiple captures and double use as a cage.

Woods, S. E., Jr. 1980. The squirrels of Canada. Nat. Mus. Canada, Ottawa. 199 pp.
Members of the squirrel family are described with photographs and drawings and in text in terms of appearance, distribution in Canada, feeding habits, reproduction, habitat, predators and economic status.

Wrigley, R. E. 1975. Survival of small mammals in a coniferous forest burn. Blue Jay 33:56-58.
Trapping of small mammals inhabiting a pond margin was carried out following a forest fire. The Sorex cinereus, S. palustris, Clethrionomys gapperi, Microtus pennsylvanicus, Zapus hudsonius and Tamiasciurus hudsonicus found there were interpreted as having survived the fire in the wet vegetation rather than as being recent colonists. Partitioning of food is discussed as the key to continued survival.

Yeaton, R. I. 1972. Social behavior and social organization in Richardson's ground squirrel (Spermophilus richardsonii) in Saskatchewan. J. Mammal. 53:139-147.

Territories, annual period of activity, behaviour and movements of Richardson's ground squirrels were studied near Regina, Saskatchewan. Males were territorial during the breeding season while females were territorial throughout the summer. Adult females maintain their territory from year to year or assume the territory of a deceased relative. Young males have the greatest tendency to disperse.

Young, B. F. and R. L. Ruff. 1982. Population dynamics and movements of black bears in east central Alberta. J. Wildl. Manage. 46:845-860.
Demographic, spatial and habitat parameters were studied for a black bear population at Cold Lake, Alberta to test the hypothesis that populations are regulated by adult males. Following removal of adult males from the study area, numbers increased.

Young, S. P. and E. A. Goldman. 1944. The wolves of North America. Vol. 1 and 2. Dover Publications, Inc., New York. 636 pp.
Historical and present distributions in North America, appearance, behaviour, reproduction, pathology, economic status, trapping methods and control methods for wolves are discussed in Volume 1. The species and subspecies of North American wolves are described in Volume 2.

Young, S. P. and H. H. T. Jackson. 1951. The Clever Coyote. The Stackpole Company, Harrisburg, Penn. and the Wildlife Management Institute, Washington. 411 pp.
The coyote is described in terms of its distribution in North America, natural history, parasites, taxonomy and its relationship with man. Management techniques are described.

Zelt, K. A. and W. M. Glasgow. 1975. Evaluation of the fish and wildlife resources of the Cooking Lake Study Area. Pp. 1-136, in Cooking Lake Area Study - Ecology. Volume 4. Alberta Environment, Planning Division.
A wildlife inventory and impact study was conducted in the Cooking Lake Moraine following proposals to stablize water levels in lakes and to import water for the lakes. Populations of fish, waterfowl, upland game birds, furbearers and ungulates are described.

Zielinski, W. J., W. D. Spencer and R. H. Barrett. 1983. Relationship between food habits and activity patterns of pine martens. J. Mammal. 64:387-396.
The food habits and activity patterns of martens were studied in California by means of scat analysis and radio-collaring. Foods varied with the season of the year. Activity also varied by season and appeared to coincide with prey activity.

Zimmerman, E. G. 1965. A comparison of habitat and food of two species of Microtus. J. Mammal. 46:605-612.

The habitat and food habits of M. pennsylvanicus and M. ochrogaster were compared in grasslands of Indiana. Important plants in the vole diets were listed. Meadow voles occurred in fields offering abundant cover and 50% or more cover in grasses. Prairie voles occurred in fields with less cover and grasses.

SUBJECT INDEX

Agriculture and Small Mammals
Acorn (1980), Andelt and Gipson (1979), Baker (1940), Bekoff (1978), Bjorge *et al.* (1981), Linhart (1981), McComb (1981), Ogilvie and Furman (1959), Ream (1981), Schowalter (1980a), Todd (1978), Todd and Keith (1973), Todd and Keith (1976), Wagner (1972), Weatherill and Keith (1969).

Alberta
Acorn (1980), Adamcik *et al.* (1978), Bjorge (1977a), Bjorge (1977b), Bjorge *et al.* (1981), Brand *et al.* (1976), Brand and Keith (1979), Burk (1979), Bush and Samuel (1981), Cole (1975), Dorwood *et al.* (1977), Fuller and Keith (1980a,b,c), Gilbert *et al.* (1979), Green (1979), Green (1980a,b), Gunson and Bjorge (1979), Gunson and Dies (1980), Gunson and Schowalter (1975), Harder (1979), Holmes and Podesta (1968), Jones (1974), Keith (1965), Keith (1966), Keith (1972), Keith and Surrendi (1971), Keith *et al.* (1977), Kemp and Keith (1970), Kucera and Fuller (1978), Meslow and Keith (1966), Meslow and Keith (1968), Meslow and Keith (1971), Murie (1973), Nagy and Russell (1978), Nellis (1969), Nellis *et al.* (1972), Nellis and Keith (1968), Nellis and Keith (1976), Norstrom (1974), Norstrom (1979), Northcott (1971), Pease *et al.* (1979), Penner *et al.* (1980), Radvanyi (1970), Rusch and Reeder (1978), Rusch *et al.* (1982), Salt (1976), Schowalter (1978), Schowalter (1979), Schowalter (1980a,b), Schowalter and Gunson (1979), Schowalter and Gunson (1982), Schowalter *et al.* (1979), Schowalter *et al.* (1978), Searing (1979), Shantz (1966), Shantz (1967), Sikes (1968), Smith (1979a,b,c), Smith (1981), Smith (1982a,b), Smith (1983), Smith and Burns (1976), Soper (1964), Stebbins (1976), Stelfox (1969), Strong and Legat (1981), Tietje and Ruff (1980), Todd (1978), Todd *et al.* (1980), Todd *et al.* (1981), Todd and Keith (1973), Todd and Keith (1976), Todd and Keith (1983), van Zyll de Jong (1963), van Zyll de Jong (1966a,b), van Zyll de Jong (1979), van Zyll de Jong (1980), Weatherill and Keith (1969), Young and Ruff (1982).

Arctic Shrew
See *Sorex arcticus*.

Badger
See *Taxidea taxus*.

Bats
Big brown - see *Eptesicus fuscus*.
Hoary - see *Lasiurus cinereus*.
Little brown - see *Myotis lucifugus*.

Bears
Black - see *Ursus americanus*.
Grizzly - see *Ursus arctos*.

Beaver
See *Castor canadensis*.

Big Brown Bat
See Eptesicus fuscus.

Canis latrans
Acorn (1980), Andelt and Gipson (1979), Bekoff (1978), Bowen (1981), Bowen (1982), Clark (1972), Fox (1975), Gipson and Sealander (1976), Hall and Sharp (1978), Hilton and Kutscha (1978), Holmes and Podesta (1968), Keith et al. (1977), King (1975), Knowlton (1972), Linhart (1981), Linhart and Knowlton (1975), MacKenzie (1976), Murie (1945), Nellis (1968), Nellis and Keith (1976), Packard (1940), Robinson (1961), Sperry (1941), Teranishi et al. (1981a, 1981b), Todd (1978), Todd et al. (1980), Todd et al. (1981), Todd and Keith (1973), Todd and Keith (1976), Todd and Keith (1983), van Wormer (1964), Wagner (1972), Wetmore et al. (1970), Young and Jackson (1951).

Canis lupis
Bjorge (1977b), Carbyn (1974), Fox (1975), Fuller and Keith (1980b,c), Gunson and Dies (1980), Hall and Sharp (1978), Harrington and Mech (1982), Harrington and Paquet (1982), Holmes and Podesta (1968), Klinghammer (1975), Laundré and Keller (1983), Mech (1966), Mech (1970), Mech (1974), Peterson (1977), Pimlott et al. (1969), Stelfox (1969), Todd et al. (1980), Voigt and Earle (1983), Young and Goldman (1944).

Capture Methods
Baker and Williams (1972), Brown (1967), Carbyn (1971), Cushwa and Burnham (1974), Davis (1982), Edwards (1952), Englund (1982), Hilton and Kutscha (1978), Hooven et al. (1979), Howard (1952), Jones and Sherman (1983), Keith et al. (1968), Lischak (1976), Ludwig and Davis (1975), Martell (1979), Mech (1974), Nellis (1968), Sargeant (1966), Smith (1981), Sonenshine et al. (1973), Trump and Hendrickson (1943), Wetmore et al. (1970), Williams and Braun (1983), Wobeser and Leighton (1979).

Castor canadensis
Aleksiuk (1968), Boyce (1981), Brooks et al. (1980), Bush and Samuel (1981), Gilbert et al. (1979), Gunson (1970), Jenkins (1981), Johnson (1976), Larson and van Nostrand (1968), Nash (1951), Norstrom (1979), Novak (1977), Packard (1940), Patric and Webb (1953), Pearson (1960), Pearson and Flook (1958), Schwanke and Baker (1977), Searing (1979), Slough and Sadleir(1977), Swenson et al. (1983), Trottier (1974), Tufts (1967).

Chipmunk
See Eutamias minimus.

Clethrionomys gapperi
Ahlgren (1966), Beck and Vogl (1972), Fala (1975), Getz (1968), Green (1979), Green (1980a,b), Kirkland and Griffin (1974), Krefting and Ahlgren (1974), Kucera and Fuller (1978), McManus (1974), Miller and Getz (1977a,b), Morris (1969), Powell (1972), Quick (1955), Radvanyi (1970), Smith and Burns (1976), Stebbins (1976), Tester (1965), Turner et al. (1975), Weatherill and Keith (1969).

Cooking Lake Moraine
Murie (1973), Purdy *et al.* (1983), Zelt and Glasgow (1975).

Coyote
See *Canis latrans*.

Deer Mouse
See *Peromyscus maniculatus*.

Denning
Bjorge (1977a), de Vos (1952), Fuller and Keith (1980a), Gunson and Bjorge (1979), Houseknect and Tester (1978), Mutch (1977), Sargeant *et al.* (1975), Sargeant and Warner (1972), Schowalter (1980b), Schowalter and Gunson (1982), Schowalter *et al.* (1979), Sheldon (1950), Stuewer (1948), Tietje and Ruff (1980).

Dusky Shrew
See *Sorex monticolus*.

Elk Island National Park
Anonymous (1975), Banfield (1946), Bouckhout (1971), Cairns (1976), Doherty (1974), Johnson (1976), King (1975), Milner (1977), Pearson (1960), Pearson and Flook (1958), Schwanke and Baker (1977), Smith (1979c), Soper (1940), Soper (1950), Soper (1951), Stelfox (1969), Telfer (1972a), Van Camp (1975), Van Camp and Telfer (1975a,b).

Eptesicus fuscus
Christian (1956), Dorward *et al.* (1977), Ealey *et al.* (1979), Fenton (1983), Jones (1974), Laidlaw and Fenton (1971), Schowalter (1979), Schowalter and Gunson (1979), Schowalter *et al.* (1978), Smith (1979a), Smith (1982b).

Erethizon dorsatum
Costello (1966), Ferguson and Merriam (1978), Harder (1979), Krefting *et al.* (1962), Marshall *et al.* (1962), Smith (1977), Speer and Dilworth (1978).

Eutamias minimus
Criddle (1943), Radvanyi (1970).

Fire and Small Mammals
Ahlgren (1966), Baker (1940), Beck and Vogl (1972), Cook (1959), de Vos (1951), Fala (1975), Fox (1978), Gruell (1980), Keith and Surrendi (1971), Koehler and Hornocker (1977), Kozlowski and Ahlgren (1974), Krefting and Ahlgren (1974), Ream (1981), Rowe and Scotter (1973), Samoil *et al.* (1977), Scotter (1964), Sims and Buckner (1973), Tester (1965), Tevis (1956), Wrigley (1975).

Fisher
See *Martes pennanti*.

Flying Squirrel
See *Glaucomys sabrinus*.

Forestry and Small Mammals
Ahlgren (1966), Conroy *et al.*(1979), Ealey *et al.* (1979), Krefting *et al.* (1962), Marstron and Julander (1961), Poelker and Hartwell (1973), Radvanyi (1970), Ream (1981), Sims and Buckner (1973), Tevis (1956).

Fox
See *Vulpes vulpes*.

Franklin's Ground Squirrel
See *Spermophilus franklinii*.

Glaucomys sabrinus
Booth (1946), Brink and Dean (1966), Cowan (1936), McKeever (1960), Radvanyi (1959), Sonenshine *et al.* (1973), Woods (1980).

Gopher
Northern Pocket Gopher - see *Thomomys talpoides*.

Ground Squirrels
See *Spermophilus*.

Groundhog
See *Marmota monax*.

Gulo gulo
Dagg and Campbell (1974), Hornocker and Hash (1981), Liskop *et al.* (1981).

Habitat(s) of Elk Island National Park
Banfield (1946), Bird (1930), Bird (1961), Bouckhout (1971), Telfer (1972a), Van Camp (1975), Van Camp and Telfer (1975a,b).

Hare
See *Lepus americanus*.

Heather Vole
See *Phenacomys intermedius*.

Hoary Bat
See *Lasiurus cinereus*.

Jack Rabbit
See *Lepus townsendii*.

Jumping Mice
See *Zapus*.

Lasiurus cinereus
Fenton (1983).

Least Chipmunk
See *Eutamias minimus*.

Lepus americanus
Adamcik et al. (1978), Adams (1959), Bider (1961), Bookhout (1965), Brand et al. (1976), Brand and Keith (1979), Buehler and Keith (1982), Cairns (1976), Conroy et al. (1979), Cushwa and Burnham (1974), de Vos (1964), Ferguson and Merriam (1978), Fox (1978), Green (1979), Green (1980a), Hansen and Flinders (1969), Keith (1966), Keith (1972), Keith et al. (1968), Keith and Surrendi (1971), Keith et al. (1978), Leonard (1980), Meslow and Keith (1966), Meslow and Keith (1968), Meslow and Keith (1971), Nellis et al. (1972), Parker (1980), Pease et al. (1979), Pietz and Tester (1983), Saunders (1963a), Telfer (1972b), Telfer (1974), Todd and Keith (1973), Todd and Keith (1983), Todd et al. (1981), Van Camp and Telfer (1975b), Weatherill and Keith (1969).

Lepus townsendii
Bear and Hansen (1966), Clark (1972), Hansen and Flinders (1969).

Little Brown Bat
See Myotis lucifugus.

Lutra canadensis
Gilbert et al. (1979), Searing (1979).

Lynx
See Lynx canadensis

Lynx canadensis
Brand et al. (1976), Brand and Keith (1979), Fox (1978), Keith et al. (1977), Mech (1974), Nellis et al. (1972), Nellis and Keith (1968), Parker (1980), Parker et al. (1983), Saunders (1963a,b), van Zyll de Jong (1963), van Zyll de Jong (1966a,b).

Management Considerations
Bookhout (1965), Boyce (1981), Brink and Dean (1966), Brooks et al. (1980), Cairns (1976), Carbyn (1974), Cole (1976), Constantine (1982), de Vos (1951), de Vos (1952), Gilbert et al. (1979), Gruell (1980), Harrington and Paquet (1982), Klinghammer (1975), Knowlton (1972), Laidlaw and Fenton (1971), McDonnell and Gilbert (1981), Norstrom (1974), Norstrom (1979), Patric and Webb (1953), Pils and Martin (1978), Robinson (1961), Sanderson (1950), Slough and Sadleir (1977), Stuewer (1948), Telfer (1972b), Tietjen et al. (1967), Todd (1978), Todd and Keith (1976), Trottier (1974), Weatherill and Keith (1969), Young and Jackson (1951).

Marmota monax
Butterfield (1954), Davis (1977), Ludwig and Davis (1975), Trump and Hendrickson (1943), Woods (1980).

Marten
See Martes americana.

Martes americana
Cowan and Mackay (1950), de Vos (1951a), de Vos (1951b), de Vos (1952), Hagmeier (1956), Hawley and Newby (1957), Koehler and Hornocker (1977),

Lensink et al. (1955), Marshall (1946), Marshall (1951), Mech (1974), Murie (1961), Quick (1955) Raine (1982), Raine (1983), Taylor and Abrey (1982), Weckwerth and Hawley (1962), Zielinski et al. (1983).

Martes pennanti
de Vos (1951a), de Vos (1951b), de Vos (1952), Hagmeier (1956), Mech (1974), Raine (1982), Raine (1983).

Masked Shrew
See Sorex cinereus.

Meadow Jumping Mouse
See Zapus hudsonius.

Meadow Vole
See Microtus pennsylvanicus.

Mephitus mephitus
Bjorge (1977a), Bjorge et al. (1981), Gunson and Bjorge (1979), Gunson and Dies (1980), Hooven et al. (1979), Houseknecht and Tester (1978), Mutch (1977), Mutch and Aleksiuk (1977), Robinson (1961), Schowalter and Gunson (1982), Sunquist (1974), Verts (1967).

Microtus ochrogaster
Fish (1974), Krebs (1977), Krebs et al.(1971), Zimmerman (1965).

Microtus pennsylvanicus
Birney et al. (1976), Bowker and Pearson (1975), Cook (1959), Eadie (1953), Fala (1975), Fish (1974), Getz (1961b), Getz (1965), Getz (1970), Grant and Morris (1971), Grant and Birney (1979), Green (1979), Green (1980a,b), Jones and Sherman (1983), Krebs (1977), Krebs et al. (1971), Kucera and Fuller (1978), M'Closkey and Fieldwick (1975), M'Closkey (1975), Morris (1969), Ogilvie and Furman (1959), Radvanyi (1970), Sims and Buckner (1973), Turner et al. (1975), Warnock (1965), Wirtz and Pearson (1960), Zimmerman (1965).

Mink
See Mustela vison.

Muskrat
See Ondatra zibethicus.

Mustela erminea
Aldous and Manweiler (1972), Fitzgerald (1977), Northcott (1971).

Mustela frenata
Fitzgerald (1977), Polderboer et al. (1941).

Mustela nivalis
Criddle (1947).

Mustela vison
Gilbert et al. (1979), McDonnell and Gilbert (1981), Searing (1979).

Myotis lucifugus
Anthony and Kunz (1977), Dorward et al. (1977), Ealey et al. (1979), Fenton (1969), Fenton (1983), Humphrey and Cope (1976), Kunz and Whitaker (1983), Laidlaw and Fenton (1971), Schowalter (1979), Schowalter (1980b), Schowalter et al. (1978), Schowalter et al. (1979), Smith (1979a), Smith (1982b), Smith (1983).

National Parks
Bowen (1981), Bowen (1982), Carbyn (1971), Carbyn (1974), Cowan and Mackay (1950), Leonard (1980), Pearson (1960), Pearson and Flook (1958), Rivard (1982), Samoil et al. (1977), Trottier (1974).

Northern Flying Squirrel
See Glaucomys sabrinus.

Northern Pocket Gopher
See Thomomys talpoides.

Ondatra zibethicus
Banfield (1946), Butler (1940), Dorohoe (1966), Gilbert et al. (1979), McCabe and Wolfe (1981), McDonnell and Gilbert (1981), Searing (1979), Stewart and Bider (1977), Wilson (1953).

Parasites
Bekoff (1978), Bush and Samuel (1981), de Vos (1952), Fenton (1983), Gunson and Dies (1980), Holmes and Podesta (1968), Johnson (1976), Todd et al. (1980), van Zyll de Jong (1966b), Young and Jackson (1951).

Peromyscus maniculatus
Ahlgren (1966), Beck and Vogl (1972), Bowker and Pearson (1975), Fala (1975), Getz (1961c), Getz (1968), Green (1979), Green (1980a,b), King (1968), Kirkland (1976), Kirkland and Griffin (1974), Krefting and Ahlgren (1974), Kucera and Fuller (1978), M'Closkey and Fieldwick (1975), M'Closkey (1975), Miller and Getz (1977a,b), Ogilvie and Furman (1959), Radvanyi (1970), Sims and Buckner (1973), Tester (1965), Tevis (1956), Weatherill and Keith (1969), Williams (1959), Wirtz and Pearson (1960).

Peat Problems
Acorn (1980), Bekoff (1978), Bjorge (1977b), Constantine (1982), Fenton (1983), Laidlaw and Fenton (1971), Schowalter (1980a), Trottier (1974), Wagner (1972).

Phenacomys intermedius
Foster (1961), Negus (1950).

Pocket Gopher
See Thomomys talpoides.

Populations - Bats
Dorward et al. (1977), Fenton (1969), Humphrey and Cope (1976), Schowalter (1978), Schowalter (1979), Schowalter (1980b), Schowalter and Gunson (1979), Schowalter et al. (1978), Schowalter et al. (1979), Simmons et al. (1979).

Populations - Carnivores
Andelt and Gipson (1979), Bekoff (1975), Bjorge (1977a), Bjorge et al. (1981), Brand et al. (1976), Brand and Keith (1979), Burk (1979), Clark (1972), Cole (1976), Dekker (1973), de Vos (1952), Fuller and Keith (1980a,b,c), Gunson and Bjorge (1979), Harrington and Paquet (1982), Hawley and Newby (1957), Hornocker and Hash (1981), Knowlton (1972), Laundré and Keller (1983), Mech (1966), Nagy and Russell (1978), Nellis and Keith (1976), Parker et al. (1983), Peterson (1977), Pils and Martin (1978), Pimlott et al. (1969), Poelker and Hartwell (1973), Rogers (1976), Roughton and Sweeny (1982), Sargeant et al. (1975), Schowalter and Gunson (1982), Searing (1979), Todd and Keith (1973), Todd and Keith (1983), Todd et al. (1981), Weckwerth and Hawley (1962), Young and Ruff (1982), Young and Goldman (1944).

Populations - Lagomorphs
Adamcik et al. (1978), Adams (1959), Bear and Hansen (1966), Bider (1961), de Vos (1964), Keith (1966), Meslow and Keith (1968), Meslow and Keith (1971).

Populations - Rodents
Ahlgren (1966), Aleksiuk (1968), Baker (1940), Banfield (1946), Beck and Vogl (1972), Birney et al. (1976), Brooks et al. (1980), Brown (1970), Cook (1959), Cranford (1983), Donohoe (1966), Green (1979), Green (1980a,b), Gunson (1970), Iverson and Turner (1972), Jolly and Dickson (1983), Jones and Sherman (1983), Kemp and Keith (1970), King (1968), Krebs et al. (1971), Larson and van Nostrand (1968), McCabe and Wolfe (1981), McCarley (1966), Michener and Michener (1977), Miller and Getz (1977a), Murie (1973), Nash (1951), Nellis (1969), Novak (1977), Patric and Webb (1953), Pearson (1960), Pearson and Flook (1958), Quimby (1951), Rongstad (1965), Rusch and Reeder (1978), Schwanke and Baker (1977), Searing (1979), Shantz (1966), Sheppard (1972), Sims and Buckner (1973), Smith (1977), Smith (1968), Swenson et al. (1983), Tietjen et al. (1967), Wilson (1953), Woods (1980).

Populations - Shrews
Buckner (1966), Clothier (1955), Doucet and Bider (1974), Ealey et al. (1979), Long (1972), Sims and Buckner (1973), van Zyll de Jong (1983).

Populations - Indices, Estimating
Davis (1982), Doucet and Bider (1974), Edwards (1952), Fafarman and Whyte (1979), Harrington and Mech (1982), Hendrickson (1939), Kline (1965), Lindzey et al. (1977), Linhart and Knowlton (1975), Lishak (1977), Martell (1979), McCabe and Wolfe (1981), Mech (1974), Novak (1977), Reid et al. (1966), Rivard (1982), Roughton and Sweeny (1982), Sanderson (1950), Sargeant et al. (1975), Simmons et al. (1979), Smith (1981), Teranishi et al. (1981a, 1981b).

Porcupine
See Erethizon dorsatum.

Prairie Vole
See Microtus ochrogaster.

Procyon lotor
Butterfield (1954), Dorney (1954), Fritzell (1978), Houston and Houston (1973), McComb (1981), Robinson (1961), Sanderson (1950), Sharp and Sharp (1956), Stuewer (1948), Wilson (1953).

Pygmy Shrew
See Sorex hoyi.

Rabbit
See Lepus townsendii, L. americanus.

Raccoon
See Procyon lotor.

Radiotelemetry
Andelt and Gipson (1979), Fritzell (1978), Fuller and Keith (1980c), Marshall et al. (1962), Mech (1974), Parker et al. (1983), Pietz and Tester (1983), Raine (1982), Taylor and Abrey (1982), Voigt and Earle (1983), Zielinski et al. (1983).

Red-backed Vole
See Clethrionomys gapperi.

Red Fox
See Vulpes vulpes.

Red Squirrel
See Tamiasciurus hudsonicus.

Richardson's Ground Squirrel
See Spermophilus richardsonii.

Saskatchewan
Grant and Morris (1971), Gunson (1970), Houston and Houston (1973), Michener and Michener (1977), Morris (1969), Samoil et al. (1977), Schowalter (1979), Schowalter and Gunson (1982), Sheppard (1972), van Zyll de Jong (1980), Yeaton (1972).

Shrews
See Sorex.

Skunk
See Mephitus mephitus.

Snowshoe Hare
See Lepus americanus.

Sorex arcticus
Buckner (1966), Ealey et al. (1979), Smith and Burns (1976), van Zyll de Jong (1983).

Sorex cinereus
Brown (1967), Buckner (1966), Doucet and Bider (1974), Ealey et al. (1979), Getz (1961a), Sims and Buckner (1973), van Zyll de Jong (1980), van Zyll de Jong (1983).

Sorex hoyi
Brown (1967), Ealey et al. (1979), Long (1972), van Zyll de Jong (1983).

Sorex monticolus
Brown (1967), Clothier (1955), Ealey et al. (1979), Ingles (1961), Smith and Burns (1976), van Zyll de Jong (1983).

Sorex palustris
Brown (1967), Conaway (1952), Ealey et al. (1979), Smith and Burns (1976), Sorenson (1963), van Zyll de Jong (1983).

Spermophilus franklinii
Iverson and Turner (1972), Murie (1973), Woods (1980).

Spermophilus richardsonii
Lischak (1976), Meslow and Keith (1966), Michener (1974), Michener and Michener (1973), Michener and Michener (1977), Nellis (1969), Sheppard (1972), Wobeser and Leighton (1979), Woods (1980), Yeaton (1972).

Spermophilus tridecemlineatus
Beck and Vogl (1972), Criddle (1939), Lishak (1977), McCarley (1966), Rongstad (1965), Woods (1980).

Squirrels
See Glaucomys, Marmota, Spermophilus, Tamiasciurus.

Striped Skunk
See Mephitus mephitus.

Tamiasciurus hudsonicus
Brink and Dean (1966), Green (1979), Kemp and Keith (1970), Rusch and Reeder (1978), Rusch et al. (1982), Smith (1968), Woods (1980).

Taxidea taxus
Errington (1937), Lampe (1982), Lindzey (1978), Messick and Harnocker (1981), Robinson (1961), Salt (1976), Sargeant and Warner (1972), Snead and Hendrickson (1942).

Thirteen-lined Ground Squirrel
See Spermophilus tridecemlineatus.

Thomomys talpoides
Baker and Williams (1972), Felthauser and McInroy (1983), Howard (1952), Marston and Julander (1961), Miller (1964), Reid et al. (1966), Sargeant (1966), Shantz (1966), Shantz (1967), Sikes (1968), Tietjen et al. (1967).

Ursus americanus
Burk (1979), Cole (1975), Cole (1976), Fuller and Keith (1980a), Gunson and Dies (1980), Lindzey et al. (1977), Mech (1974), Nagy and Russell (1978), Norstrom (1974), Penner et al. (1980), Poelker and Hartwell (1973), Rogers (1976), Tietje and Ruff (1980), Young and Ruff (1982).

Ursus arctos
Cole (1976), Nagy and Russell (1978).

Varying Hare
See Lepus americanus.

Voles
See Clethrionomys, Microtus, Phenacomys.

Vulpes vulpes
Dekker (1973), Englund (1982), Fox (1975), Hilton and Kutscha (1978), Pils and Martin (1978), Sargeant et al. (1975), Scott (1943), Scott and Klimstra (1955), Sheldon (1950), Voigt and Earle (1983).

Water Shrew
See Sorex palustris.

Weasels
See Mustela erminea, M. frenata, M. nivalis.

Western Jumping Mouse
See Zapus princeps.

Wolf
See Canis lupus.

Wolverine
See Gulo gulo.

Woodchuck
See Marmota monax.

Zapus hudsonius
Getz (1961c), Hamilton (1935), Quimby (1951), Whitaker (1963).

Zapus princeps
Brown (1970), Cranford (1978), Cranford (1983).

POOR

QUALITY

ORIGINAL